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THE "MODIFIED EXAMINATION" OF THE PHARMACEUTICAL SOCIETY.

A GUIDE TO THE PRINCIPAL POINTS IN PRESCRIPTIONS, DISPENSING, MATERIA MEDICA, AND PHARMACY.

BY

F. HARWOOD LESCHER.

THE

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MDCCCLXIX.

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TO THE PRESIDENT

OF THE

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN,

AS A

TRIBUTE OF ADMIRATION FOR HIS EXERTIONS IN THE ADVANCEMENT OF PHARMACY IN ENGLAND—

EXERTIONS THAT THE PRESENT YEAR HAS SO BRILLIANTLY CROWNED WITH SUCCESS.

THE AUTHOR.

December 20th, 1868.

PREFACE.

THIS work is an *aperçu* of the four subjects to be taken up at the Modified Examination of the Pharmaceutical Society.

Its essential character is the columnar or tabular arrangement; this may be considered as the natural consequence of a fixed idea as to the importance, in the pursuit of such quasi-scientific studies, of a *systematic* classification of the several divisions of a subject.

It is intended as a guide to the salient points in the four departments of study, and to act also as an aid to the remembrance of the main heads of what may have been the objects of a lecture or instruction; and, by exciting the interest of the student, to induce him to devote more time and attention to practical experiment and to serious study. Its aim may be given in two words—suggestions to the mind; assistance to the memory.

The standard text-books have been scrupulously followed by the author: among those works that have been more especially referred to, may be mentioned Pereira's "Materia Medica," Bentley's "Manual of Botany," Redwood and Möhr's "Practical Pharmacy," Squire's "Companion:" the author also has to offer his most sincere thanks to those friends who have given him help in the collection of information, and more especially to one who has most materially lightened his labours by his valuable assistance in the correction of the proof-sheets of the work.

CONTENTS.

SECTION I.

PRESCRIPTIONS.

		PAGE
PART I.	THE FORM, WITH EXAMPLES	1
„ II.	UNUSUAL OR ERRONEOUS PRESCRIPTIONS	4
„ III.	POSOLOGY	7

SECTION II.

DISPENSING.

„ I.	PRACTICAL DISPENSING	9
„ II.	AIDS TO DISPENSING	11

SECTION III.

MATERIA MEDICA.

„ I.	ARTICLES OF MATERIA MEDICA	15
„ II.	MEDICINAL PLANTS	36
„ III.	ADULTERATIONS	38
„ IV.	CHEMICALS OF PHARMACOPŒIA	43

SECTION IV.

PHARMACY.

„ I.	PREPARATIONS OF PHARMACOPŒIA	51
„ II.	ACTIVE INGREDIENTS	68

[*The figures in parentheses in the section of Materia Medica and Pharmacy, refer to the several numbered Specimens in the Cabinet published by* MESSRS. EVANS & CO., 60, Bartholomew Close, London, *and by* MESSRS. EVANS, SONS, & CO., Liverpool, *to accompany this Work. Price,* 15*s.*]

THE "MODIFIED EXAMINATION."

SECTION I.

PRESCRIPTIONS.

PART I.—The Form of a Prescription, with Examples.

THE first point in dispensing, or rather the prologue to it, without which practical dispensing can have no existence, is the Prescription. The reading and perfect comprehension, therefore, of the prescription is an *essential* in the consideration of the several branches of knowledge necessary to the dispenser: however, by the classification of the various points to be mastered, each, taken by itself, becomes simple and easy; and to no one more than the chemist is the division of a subject into its different heads, and their separate examination, more serviceable. He will find a subject, however difficult—a work however laborious—an instruction however complicated—unravel itself before his eyes, if one head, one division, be taken and perfectly understood before another is allowed to take up any portion of his attention. The longest day consists of many rapidly-passing seconds; the hardest subject, of a number of facts or points, each by itself easy and capable of being soon overcome. The philosopher's stone that thus simplifies the most complicated undertaking is—*system;* a systematic division of the work in hand is the surest means to its perfect comprehension and to its rapid termination.

In the examination of prescriptions, we may divide the subject into four heads:—

1. The language.
2. The body, or main portion, comprising—
   - (α) Component ingredients.
   - (β) Quantities.
3. Directions.
4. Examples.

1. THE LANGUAGE.—Prescriptions are generally now written in Latin; owing, however, to but a limited number of words and expressions being used in their construction, this ought to offer but slight difficulty. A knowledge of the expressions (or idioms) in common use is necessary also, on account of the crabbed handwriting so often met with. It seems, in many cases,

that bad writing is almost to be considered a necessity in the art of prescribing. To become acquainted with these set phrases, and also to acquire readiness in the reading of autograph prescriptions, a fair amount of practice is requisite: this cannot, any more than practical dispensing, be acquired from books: nor is it within the scope of the present work to teach the Latin language, which is essential; the chapter on the grammatical construction of the language in Pereira's "Selectæ e Præscriptis" will give a good insight into this subject; suffice it to say, however, that the words used are almost always abbreviated, the proper terminations being very rarely made use of in actual practice.

2. The Body of the Prescription.—The heading is at left hand corner, ℞, or recipe. The designation of the ingredients comprises (α) the articles to be dispensed, and (β) the quantities of these said articles to be weighed or measured.

(α) These are either—(1) Articles of Materia Medica, in the state of nature, or powdered, &c.	*Ex.* Sennæ Alexandrinæ. Rad. rhei. Pulv. jalap.
(2) Preparations of the Pharmacopœia.	*Ex.* Potassæ acetatis. Hyd. perchlor. Spt. am. arom. Tinct. opii ammon.
(3) Special forms of preparations, either proprietary or in use at certain hospitals, &c.	*Ex.* Liq. opii (Batt.). Chlorodyn.

The component ingredients are almost always abbreviated; if at full, the terminations are in the genitive case, after ℞ (recipe—*take*—of such and such articles, &c.).

(β) The quantities, expressed in the ordinary signs of apothecaries' weights, and in Roman figures.	*Ex.* ♏iij = three minims, or drops. ℥iv = four ounces. Oj = one pint.

3. The Directions, or Subscription.—*This is the portion of the prescription that perhaps requires the greatest care.* It is generally written in set phrases, which may be varied in their arrangement or grammatical construction, but are rarely set aside for idioms not sanctioned by medical nomenclature. The abbreviations and contractions in common use cannot satisfactorily be learned, with any good result, from books; for this purpose the study of actual autographs we consider an absolute necessity.

The directions used in simple prescriptions may be classified as follows: examples are given, with the terminations (*generally*, in practice, omitted) *in italics*.

α Union of ingredients	*misce*	mix.
	sume	take.
	tere	rub-up.
	pile	powder (in a mortar?)
	cola	strain.

β Form of administration	fiat mist*ura*	let a mixture be made.
	,, haust*us*	,, draught ,,
	f*iant* pulv*eres*	,, powders ,,
	,, suppos*itoria*	,, suppositories ,,
	m*ore* sol*ito*	in the usual way.
γ State of division	mit*te* pulv*eres* x.	send ten powders.
	div*ide* in part*es* tres	divide into three portions.
	,, ,, æqu*ales*	portion into equal parts.
δ Dose	coch*leare* min*imum*	tea-spoon.
	coch*learia* amp*la*	table-spoons.
ε How administered	appl*icetur*	apply.
	cap*iat* æger	let the patient take.
	gutt*atim*	drop by drop.
	in efferv*escentiâ*	while in a state of effervescence.
	quant*um* suff*icit*	as much as is required.
	sec*undum* art*em*	in a proper way.
ζ How often to be taken	alt*ernis* hor*is*	every other hour.
	omni semihor*â*	,, half-hour.
	,, bihor*iâ*	,, two hours.
	ad tert*iam* vic*em*	thrice.
	indies, quotidie	daily.
	omn*i* hor*â*	every hour.
η When to be taken (time)	man*e* nocte*que* sum*endum*	to be taken morning and night.
	cras nocte	to-morrow evening.
	ad lib*itum*	whenever (the patient) chooses.
	post jent*aculum*	after breakfast.
	hor*a* sol*ita*	at the usual hour.
	hor*a* somn*i*	at bed-time.
	die*bus* alt*ernis*	every other day.
	hod*ie* vesp*ere*	this evening.
θ When to be taken (under what circumstances)	ut (si) opus sit	as necessary—if necessary.
	pro re nat*â*	as there is occasion (for it).
	tuss*i* ingrav*escente*	if the cough increases.
	post sing*ulas* sed*es* liqu*idas*	after each attack of diarrhœa.
ι Length of time to be administered	per hebdom*adem*	for the space of a week.

x Attendant circumstances . . .	phialâ agitatâ	the bottle to be shaken (after it *has* been shaken).
λ Result intended	ad alvi plenam solutionem . .	to relieve costiveness.
	ad vomitum promovendum . .	to produce vomiting.
	ad sudationes diminuendas . .	to reduce the perspiration (sweatings).

4. EXAMPLES.—We give but few examples of prescriptions, referring the student to autograph examples; more will be learnt by carefully studying a dozen of the latter than by spending hours over examples in books.

℞ Sodæ sulphat. . ℥jss
,, phosph. . ℥j
Syr. rhœados . ʒiv
Aq. cinnamom. . ℥vj
M. ʒj statim sumend. et dosis repetat. omni bihoriâ donec alvus purgetur.

℞ Acid phosp. dil. . ℥j
Syr. zingiberis . ℥ss
,, aurantii . ℥jss
Fiat mistura, cujus sum. cochl. min. omn. sext. hor. in aq. cyath.

℞ Tinct. hyoscyam. . ʒss
,, opii . . ʒj
Mist. cretæ . . ℥vj
M. Cochl. duo magn. ter quaterve alternis horis donec dolor leniat.

℞ Scammon. . gr. xxx
Hyd. subchlor. gr. xx
Pulv. jalap. . ʒj
Fiant pilulæ viginti, quar. capiant. duo ante somnum alternis diebus.

PART II.—Prescriptions.

1. UNUSUAL. 2. ERRONEOUS.

1. UNUSUAL:

This class of Prescriptions may be defined as being safe, or even *necessary*, for certain persons or in certain cases; but yet, owing to the largeness of the dose, &c., *not* to be dispensed without remark.

EXAMPLE:

℞ Hyd. chlor. gr. v
Ol. croton tig. ♏ij
M. Fiat pilula, statim sumend.

REMARKS:

Such a formula ought not to be made up without some knowledge of the case. The dose of Ol. Croton Tiglii is unusually large, especially combined with the quantity of Calomel. However, in certain cases (as in epilepsy), such quantities may be the means of saving life.

EXAMPLE:

℞ Tinct. opii ℥j
Aq. cinnam. ℥iij
M. Sum. ℥j quotidie ante noct.

REMARKS:

If this be correct, it is a case of *idiosyncrasy*. The quantity of T. opii (℥ ij) at a dose is poisonous; however, by continuance in the taking of opium, the system can support even larger doses. This prescription ought only to be dispensed as written with a knowledge for whom it is intended; the first idea would naturally be that the sign ℥ is written in mistake for the sign ℥.

N.B.—Some physicians prescribe, and some systems can bear, what are generally looked upon as excessive doses; but these are the exception, and not the rule: the dispenser should be guided by his knowledge of the poisonous and the ordinary doses of the more powerful vegetable and mineral medicines, and should never make up unusual quantities without a communication with the writer of the prescription, or a certain knowledge of the patient for whom it is intended.

2. ERRONEOUS.

A prescription may contain errors in each of its parts—

(α) In the names of the ingredients.
(β) The quantities (or doses).
(γ) The directions.

(α) ERRORS IN NOMENCLATURE.

This may occur from one name being used where another article is intended; from the use of an *obsolete* name, &c.

EXAMPLE:

℞ Hyd. perchlor. gr. iv
Ext. hyoscyam. gr. ij
Pil. hyd. gr. vi
Fiant duæ pilulæ, una quâque nocte sumenda.

REMARKS:

Here is a palpable error; as prescribed, *poisonous*. It is clear, however, that hydrargyri subchlor. was intended; and although, if it be possible, the chemist should communicate with the writer of the prescription, yet, where this is not in his power, he would be justified in making up the pills, with the substitution of calomel for hydrargyri perchloridum.

(β) Errors in Quantities or Doses.

This may arise from the substitution of signs, as ʒ for 3 ; from forgetfulness of the full dose of an article, &c.

Example:

℞ Zinc. chlor. gr. vi
Aquæ dest. 3 iv
Fiat inject., ter die utend.

Remarks:

The strength is here so unusual that it is clear that the sign 3 has been erroneously placed for the sign ʒ. Such a prescription ought not to be made up, there being *clearly* a mistake in the quantities as prescribed.

Example:

℞ Liq. am. acetatis 3 ss
Syr. aurantii ʒ ij
Liq. morph. acet. 3 iij
P.L.
Misce.

Remarks:

The error here lies in the *substitution* of the signs. The prescriber must have intended the larger quantity to apply to the Liq. am., and the smaller (3 ss) to the Liq. morph. Whatever might be the directions (here they are omitted), this would be the assumption.

γ) Errors in the Directions.

Although an error may here occur in several different ways, yet it will generally resolve itself into a question of doses. The dispenser should note, in order that no error of sufficient importance to endanger the health of the patient should be present *undetected*—

Points to be noted.	*Examples.*
(α) That the union of the ingredients and the form of administration are perfectly safe.	Incompatibles, as acids and alkalies, in a mixture. Strong acids without sufficient diluents.
(β) That the division is correct.	Ext. opii, gr. x, might in a prescription be ordered to be divided into *two* instead of *ten* pills; if made up, one pill would be poisonous.
(γ) That the actual dose is correct.	See chapter on "Posology, or Doses."
(δ) That the administration as ordered is safe.	℞ Tinct. canthar. ʒ ss Linim. sapon. ʒ iss Misce. ʒ ss. omni nocte sumend. Here an *external* remedy is, by mistake, ordered to be taken internally. *Utend.* would be the correct word, or even more detailed directions.

Points to be noted.	*Examples.*
(ε) That it is not to be taken too frequently.	A large dose of opium or strychnia *omni horâ* instead of *omni die*, or *quotidie*.
(ζ) That the time of administration and attendant circumstances suit the medicine.	An emetic *ante cibum*, or a full dose of morphia *mane* instead of *nocte sumend.*

(N.B.—Though it is not absolutely necessary, yet it is advisable to give a glance to these "accessories.")

The above are the principal errors to be met with in prescriptions. If the dose be neither unusual nor erroneous, and the directions do not present any point out of the usual order, the prescription may be dispensed with complete safety.

PART III.—Posology.

This division treats of the usual doses in which nearly all medicines may safely be administered; there are, of course, exceptional cases where they may be much exceeded; still, as a *general* rule, any dose for an adult, much exceeding those in the following tables, must be looked upon as unsafe, or, in many cases, even dangerous.

The following is a classification in which the examples given are those that are most likely to be met with in the majority of cases coming under the notice of the dispenser in his ordinary work:—

1. GRADUATED GROUPING OF DOSES.

POISONOUS.		POWERFUL.		STRONG.	
$\frac{1}{60}$ to $\frac{1}{12}$ gr.	$\frac{1}{8}$ to $\frac{1}{4}$ gr.	$\frac{1}{4}$ to $\frac{1}{2}$ gr.	1 to 3 gr.	2 to 10 gr.	10 to 30 gr.
Arsenic.	Hyd. iodid.	Iodum.	Berberina.	Bismuth subnitras.	Potass. bromid.
Strychnia.	Hyd. perchlor.	Ext. stramonii.	Antim. sulphur.	Plumbi acet.	Ergota.
	Sodæ arsenias.	Ol. croton ($\frac{1}{3}$ to 1 ♏).	,, tartaratum (*emetic*).	Potass. iodid.	
	Ferri arsenias.		Podophylli resin ($\frac{1}{4}$ to 2 gr.).	Acid. tannic.	
	Argent. nit.		Opium ($\frac{1}{2}$ to 2 gr.).	Ferri et quin. citras.	
	Antim. tartaratum (*diaphoretic*).		Acid. carbolic. (1 gr.).	Hyd. c. cretâ.	
	Elaterium.		Cupri sulph. (*astringent*) ($\frac{1}{4}$ to 2 gr.).	Cupri sulph. (*emetic*).	
	Morph. hydrochlor. et acet.		Quin. sulphas.		
			Santoninum.		
			Hydrarg. subchlor.		

2. Doses of Preparations—in Classes.

Articles.	*Doses.*	*Examples.*	*Exceptions.*	
Powdered Drugs	1 gr., *powerful.* 5 to 10, *strong.* 20, *ordinary strength.*			
Aquæ	½ to 2 oz.		Aquæ laur. cerasi.	5 to 30 ♏.
Acetæ	60 ♏			
Confectiones			Conf. opii.	5 to 20 gr.
Decocta	1 to 2 oz.			
Extracta	½ to 1 gr., *powerful.*	Aconit. Cannab. ind. Opium. Belladon. Nux vomic.	Ext. physostigmat. ,, stramonii	1/80 to ¼ gr. ¼ gr.
	3 to 6, *strong.* 5 ,, 10, *ordinary strength.*			
Infusæ	1 to 2 oz.		Inf. digitalis	¼ to ½ oz.
Liquores			Liq. sodæ arsen. ,, arsenical ,, arsen. hydroch.	2 to 8 ♏
			,, atropiæ	1 ♏.
			,, bismuth	30 to 60 ♏
			,, hyd. perchlor.	30 to 120 ♏
			,, morph. acet. ,, ,, hydroch.	10 to 60.
Olea essent.	1 to 4 ♏.			
Pilulæ	5 to 10 gr.		Pil. plumbi c. opii.	4 gr.
			,, sapon. co.	3 to 6 gr.
Pulveres	*as above*		Pulv. antimonialis	2 to 6 gr.
			,, opii co.	2 to 5 gr.
Syrupi	60 gr. to ½ oz.			
Tincturæ	5 to 20 ♏, *powerful*	Aconit. Belladonnæ. Cannab. indic. Iodi.		
	10 to 30 ♏, *very strong*	Digitalis.		
	15 to 60 ♏, *strong*	Hyoscyam. Ergota.		
	60 to ½ oz., *ordinary strength.*			
	½ oz., *weak.*	Rhei (*as purgative*).		

SECTION II.

PRACTICAL DISPENSING.

PART I.—Hints on Practical Dispensing.

THE most important of the several duties of one intending to enter life as a Pharmaceutist is, without doubt, Dispensing: and with reason, for it is in the making-up of prescriptions that the amount of scientific knowledge is required which elevates Pharmacy, and which, by rendering absolutely necessary a certain educational cultivation and scientific training—not required in the case of the ordinary seller of goods—places the mind on a higher level, and the man in a more refined position.

In the examinations of the Pharmaceutical Society great but not undue prominence has been wisely given to Practical Dispensing. The candidate is expected to repeat in a satisfactory manner the ordinary act of his every-day life; for it is rightly considered that, after the practice of several years, it is only just to exact that amount of knowledge and manipulation, without which it would be useless to expect, in after life, success for oneself or safety for those requiring our services.

We will now consider the *modus operandi* of the compounding of a prescription.

AXIOMS.	REMARKS.
Read the prescription throughout.	It is always advisable to go through the prescription carefully, even to the directions. By this means, *first*, a good idea of the formula as a whole is acquired; and, *secondly*, any overdose, or poisonous proportions, or the presence of incompatibles, are noticed.
See that the ingredients are at hand.	This avoids the necessity, when half through the work, of being compelled to stop while a powder, &c., is got ready. The several ingredients ought to be brought forward (or seen to be in their places) before commencing.
Examine the accessories.	The fittings of the dispensing department ought to be of the most perfect description, clean to the last degree; the bottles, scales, measures, &c., in repair, and of the kind adapted to the work on hand.
Set to work quickly.	Dispatch is necessary to good dispensing, and in its turn is much aided by neatness and a *thorough* completion of each part or division of the work on hand, before taking-up another portion. But waste no time: from the very nature of the business, there are times when an unusual number of prescriptions will have to be made up, and dispatch, at all times advisable, will then become a necessity.
Weigh and measure carefully.	The careful manipulator is above all things characterized by his method of weighing and measuring. In using a measure, hold it up to the light, so that the two lines marked on either side of the glass, at each graduated quantity, shall be in one line of sight, and the liquid at the same time exactly reaches up to these two marks.

Use the pestle gently yet firmly.	Do not pound and bring down the pestle with force (as regards composition mortars), but rather use it as a lever, and the side of the mortar as its fulcrum, pressing against and working up the material under operation. It is astonishing what an amount of force is thus brought to bear by this apparently simple method of handling the pestle.
Make sparing use of the mortar.	Only use if absolutely necessary; for pills, especially if few in number, a slab (porcelain) is preferable on every account; although, for the more intimate mixture of powders, the mortar, to be followed if necessary by the sieve, is often of service.
Judge the best order in which to mix the ingredients.	The more volatile ingredients should be added last. Ammonia or chloroform would lose a great deal if worked up in a mortar with the other ingredients of a formula. Add the bulky menstruum last, though add (in a mixture) some of the diluents before putting in a powerful acid or alkali. If extracts or powders enter into the composition of a mixture, rub them up first of all into a thin paste with a little of the liquid menstruum.
In pills, choose with judgment the best excipient.	From a knowledge of the properties of the ingredients ordered, judge if you require in the excipient,— (*a*) adhesiveness; (*b*) firmness; (*c*) plasticity, combining the above two. Often the articles have these qualities, but simply require them to be developed. For the proper excipients for each class of article, see Part II. of this Section.
For emulsions, choose specimens with much oil.	As an emulsion requires for its perfection a certain quantity of oily matter, choose Gum Myrrh, &c., with a *fatty* appearance (never powdered); Almonds, new and soft, &c.
Proceed with emulsions in a certain order.	Oil or fat intended to be suspended by means of an alkali in water is best prepared by adding the oil to about its own quantity of water, mixing intimately with the alkali, and putting to it the rest of the diluent. The mucilage, freshly made, that is generally used to suspend Copaiba, should be worked up with a few drops only at a time of the oleo-resin, and diluted with water, before each fresh addition. If there happen to be any other ingredients in the formula, the time for adding them is when the *emulsion proper* is completed.
For powders, begin with least active ingredients, &c.	The advantage of this method of procedure is that the more powerful ingredients are thus well diffused through the whole bulk of the *diluting* powder. In the division of powders, it is always preferable to weigh than simply to divide them; besides ensuring a more perfect division, it checks the presence of all the ingredients, by the discovery in such a case of (say) ten or eleven in place of twelve powders.
In finishing the preparation of a formula, do not leave behind any appreciable quantity.	See that every particle of the ingredients is as far as possible taken up; in other words, that the accessories (mortar, measures, &c.) are left clean and well scraped. From the neglect of this the unskilful dispenser will sometimes leave a pill or two in his mortar, or a couple of drops in his minim measure.
Re-peruse the prescription.	Read the prescription again carefully, and check the quantities, &c. This is a capital plan to escape serious error, by detecting and correcting any mistakes or omissions that may have arisen during the making-up of the prescription.

AXIOMS.	REMARKS.
Finishing up.	Pay special attention to neatness in writing the directions, and in wrapping up the medicine. We may presume the mixture, &c., is correctly dispensed; there is no longer any question of *that*. We have now only to give all our attention to the presentation of the medicine under the most favourable circumstances to the patient of refined taste, or perhaps ultra-delicate nervous system. The attainment of this end requires rather negative than positive qualities. Draughts, &c., must be directed and put up with the most scrupulous neatness:—no display, no flourishes of the pen, no exhibition of parti-coloured sealing-wax; at the same time a thorough attention to details—vials of the cleanest, paper of the whitest, general finishing-off of the most perfect good taste.

PART II.—Aids to Dispensing.

This portion of our section will give some slight classification of various examples of pills, emulsions, &c. Although, either in emulsion or pill, almost every separate combination of ingredients might be treated in a different way, and with advantage, yet it will be found eminently satisfactory to divide into classes the majority of the articles of the Materia Medica; and thus, on operating with any drug, or combination of drugs or chemicals, the excipient or *modus operandi* of the class can, on the spur of the moment, be employed: and even if the article be *unusual*, or made up by the dispenser for the first time, then *that* excipient may be used which is applicable to some similar drug or chemical, or that has already been found to have been useful in a similar position or a parallel dilemma.

PILLS.

We will take into consideration, in the first place, that important class of remedies, Pills. The pill is one of the most useful of all forms for the administration of medicine; it is generally taken with facility, it can be made available for all but the more fluid drugs or preparations, it is the most convenient vehicle for the exhibition of those powerful articles of the Materia Medica that have been of late years so much in vogue, and, lastly, the effects, though sure, are generally (to the advantage of the patient) slow, and regulated by the action of the digestive powers.

Although almost all medicines may be given in this form, yet a different manipulation is required in many different cases. In the first place, three essentials are required for a pill:—

1. Firmness.
2. Adhesiveness.
3. Plasticity.

1. *Firmness.*—It is necessary that a pill should have sufficient substance; that it should be hard, firm, and solid; that it should also retain its shape for a reasonable length of time. At the same time, this quality should not be exclusively given by means of a substance possessing not only hard (*present*) but hardening (*future*) qualities; as, for example, powdered Tragacanth.
2. *Adhesiveness.*—A very necessary quality. It represents the amount of viscid tough cohesion that prevents the particles of the pill from crumbling away. It may be given to the several ingredients by the use of some excipient possessing that quality, or it may,

by the addition of something, be brought out, existing already, though undeveloped, in one or more of the ingredients. For the display of adhesiveness, a state of semi-fluidity (or quasi-softness) is absolutely essential.

3. *Plasticity* is a well-balanced union of these two qualities, or, to a certain degree, opposite forces. Its presence gives the perfection of a pill-mass: sufficient softness to roll out with ease, with the firmness requisite to enable the pill to maintain its correct shape.

In order to impart these qualities to those combinations of ingredients that do not of themselves possess it, we make use of certain menstrua, inert in themselves, which we term *excipients*. These excipients are of various natures, to be used in accordance with the effect required, or the main ingredient that is to be brought to what is called a pilular consistence. In the consideration of the several excipients, we may divide them into five classes: the illustrations are intended to act also as a classification of the pills of the Pharmacopœia.

Class I.—Those articles requiring an excipient possessing both firmness and adhesiveness.

Example.	*Excipients.*
The mineral preparations of iron, mercury (calomel), lead, &c.	Confect. rosæ Gall.; manna.
The aloes pills of the Pharmacopœia	Confect. rosæ Gall. (with or without the addition of powdered hard soap).
Quiniæ sulphas	Confect. rosæ canin.

Class II.—Those articles requiring not so much *firmness* as moist soft *adhesiveness*, that will enable them to be built up into a pill-mass. An excipient that tends to the conservation of the article, and that does not crystallize, is in many cases advisable. Treacle fulfils all these conditions. Most powdered vegetable substances, and, in some combinations, the gum-resins, come under this head.

With articles, as jalap or rhubarb, that contain in their composition a *resin* in any quantity another treatment may be adopted. If syrup be used, add the whole quantity *at once*, to prevent the probable formation of a hard mass; but frequently glycerine, water, or weak spirit, may be used with advantage: *size* is reduced, though at the expense of plasticity.

Examples.	*Excipients.*	
Ipecacuanha	Treacle.	Water.
Rhubarb, as in *pil. rhei comp.*	Syrup.	Proof spirit.
The gum-resin in *pil. assafœtid. comp.*	Glycerine.	
The ingredients in *pil. scillæ comp.*	Treacle and powdered soap.	

Class III.—Those articles requiring, not adhesiveness alone, but essentially *firmness*.

N.B.—It is often advisable, if the ingredients are of themselves, or when put together (in combination or in process of preparation), sufficiently moist or soft, to add, for instance, instead of treacle, &c., powdered sugar, or sugar and powdered liquorice. This has often even *increased* conservative effect.

Example.	*Excipient.*
Iodide of iron in *pil. ferri iodidi*	Powdered sugar; liquorice-root.
Opium in *pil. saponis co.*	Powdered soap; water.

CLASS IV.—Those articles requiring special methods of manipulation.

(α) Resins and gum-resins.

Articles.	*Excipients.*
Gum-resins, as aloes	Alkalies, as carb. potash (as in *dec. aloes co.* for *aloes*), often with water.
Resins, as in *pil. coloc. comp.*	Spirit; soap. Mucilage.

(β) Oils and oleo-resins.

Articles.	*Excipients.*
Copaiba (oleo-resin)	Magnesia, its weight of carbonate, or ⅓ of calcined. Soap and magnesia.
Volatile oils	Crumb of bread, &c., &c.

(γ) Articles of a fatty nature.

Articles.	*Excipients.*
Unguentum hydrargyri	Calcis phosphas.

(δ) Exceptional cases.

Articles.	*Excipients.*
A resin, with mineral powders, as in *pil. hyd. subchlor comp.*	Some fixed oil, as castor oil.
Ol. croton, argent. nit.	Crumb of bread.
Pepsine, benzoic acid, &c.	Glycerine.
Kreosote	Magnesia and soap (very little).

EMULSIONS.

An emulsion is the name given to the suspension of an oily, resinous, or fatty substance in a watery liquid, by means of some fluid having the property of dividing and surrounding the particles of oil, &c., which thus remain in a suspended state. Milk is a good example of a natural emulsion. Their perfect preparation is in pharmacy a matter of much importance; and although special care is necessary, yet success can generally be insured by great attention being paid to the right method of manipulation. A good emulsion may be made by mixing intimately some fixed oil with about one-sixth its quantity of solution of potash and with its own quantity of water. A milky liquid is the result, to which the necessary amount of water (six or seven times the quantity of oil) may now be added.

The following are some of the ordinary excipients used in their preparation:—

Actives.	*Excipients.*
1. Gum-resins, as myrrh, ammoniacum, &c., as in *mistura ammoniaci* . .	Water.

The simple working up with water is sufficient to effect, by means of the gum, the suspension of the resin; thus recurring to their actual state when in the latiferous vessels of the plant.

Resins, as guaiacum in *mistura guaiaci*	Sugar and powdered gum acacia.
Almonds, &c., as in *mistura amygdalæ*	Water.
2. Copaiba (oleo-resin)	Mucilage.
Some fixed oils, as ol. ricini	
Sometimes gum-resins, as assafœtida	

Proceed as in the instructions in the first part of this Section.

3. Fixed oils, as oleum amygdalæ, &c.	Alkali (as liq. potassæ).
4. Scammony, as in *mistura scammonii*	Milk.
Resin of jalap	Almonds or almond emulsion.
5. Bals. Peru, turpentine, solid fats, cetaceum, occasionally fixed oils, as castor oil	Yolk of egg. (N.B.—1 oz. ol. ricini is sufficiently suspended with one egg's yolk.)

In concluding this second portion of our work, let us assure all students that *dispensing*, carried to perfection, ever requires sound judgment, a quick eye, and a thoroughly well-practised hand. One of the surest guides to their acquirement is *neatness*, both in dress and in general arrangements. The reverse of this quality cannot but lead to ultimate failure: the dirty apron, the disorderly hair, the nails clogged with dirt, are, in one engaged in occupations requiring such delicacy and skill, thoroughly to be reprobated, and most scrupulously to be avoided.

SECTION III.

MATERIA MEDICA.

PART I.—Characteristics of the Principal Articles of the Materia Medica.

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
RANUNCULACEÆ.		
ACONITUM NAPELLUS. *Monkshood.* Europe.	ROOT—Tapering rapidly, with fibrils. *Colour*—EXT. coffee-coloured. INT. yellowish brown. *Odour*—Faintly narcotic. *Taste*—Acrid; numbing. LEAVES—Large, much divided.	Narcotic; sedative. Aconitia. (Fig. 25.)
PODOPHYLLUM PELTATUM. *Podophyllum.* North America.	RHIZOME—Long, thin, wrinkled, irregular, with rootlets. *Colour*—EXT. dark reddish brown. INT. whitish.	
MENISPERMACEÆ.		
CISSAMPELOS PAREIRA. *Pareira-brava.* South America. West Indies.	ROOT—In cut lengths, with apparent pith, and concentric zones; rough. *Colour*—Dark brown. *Taste*—Sweet, then bitter.	Diuretic. (Fig. 69.)
JATEORRHIZA COLUMBA. *Calumba.* Mozambique. Africa.	ROOT—Transverse sections of thick fleshy root, depressed in centre. *Colour*—EXT. dark brown. INT. bright yellow. *Taste*—Very bitter.	Demulcent; tonic. Calumbine. (Berberine. ?) (Fig. 16.)
PAPAVERACEÆ.		
PAPAVER SOMNIFERUM. *Garden Poppy.* Levant. Asia Minor.	OPIUM—Inspissated juice. (α) Smyrna. Irregular masses, rounded or flattened; softish; made up of agglutinated tears. EXT. covered	Three *successive* actions:— 1. Stimulant. 2. Depressing (to nerves). 3. Narcotic.

India.
Persia.
Europe.

(dock) capsules.
Colour—Reddish brown, changing to black.
Odour—Heavy, narcotic; not *mouldy*.
Taste—Acrid; nauseous.
Touch—Waxy, *not* greasy.
(β) Constantinople. Small hard cakes; less in value; less narcotic and more mucilaginous.
(γ) Egypt. Inferior; hard. (None in commerce at present day.)
Colour—Reddish.
Odour—Musty.
(δ) Persian, European, Indian (for Chinese markets).

Morphia.
Codeia.
Meconic acid.

PAPAVER RHŒAS.
Red Poppy.

DRIED FLOWERS—(*Petals*).
Fresh—Bright red.
Dried—Dull in colour.
Odour—Faintly narcotic when recently gathered.

Little astringency; no anodyne properties.

CRUCIFERÆ.

COCHLEARIA ARMORACIA.
Horse-radish.

Cultivated in Britain.

ROOT—Very gradually tapering, though suddenly for an inch *immediately* below the stem.
Colour—EXT. and INT. yellowish white.
Odour and Taste—Pungent.

Antiscorbutic; rubefacient.
Essential oil.

(α) SINAPIS ALBA.
(β) ,, NIGRA.
The two Mustards.

Indigenous.

SEEDS,—
(α) *White*—Round, larger than the black.
(β) *Black*—Small, reddish black, veined, pungent if bruised with water.

Stimulant; rubefacient; diuretic.
Oils developed on treatment with water.

POLYGALACEÆ.

POLYGALA SENEGA.
Virginian Snake-root.

United States.
North America.

ROOT—Irregular, rough; principal root-stock, with rootlets, enlarged at apex, with trace of stem; ridge running along the concave side.
Colour—EXT. brownish grey; resinous. INT. whitish grey.
Smell—Nauseous when fresh.
Taste—At first, sweetish; then, irritation and flow of saliva.

Diuretic; emetic; cathartic.
(Fig. 24.)

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
KRAMERIA TRIANDRA. *Rhatany.* Northern part of South America.	ROOT—Two varieties; (α) Peruvian. (β) Savanilla. (α) Long (½ ft. to 2 ft.), thin, with vestiges of stem at apex. *Root-bark*—Rough; separable with ease. *Colour*—Reddish brown. (β) Short roots. *Root-bark*—Smooth, soapy to the touch; adheres firmly, and separable with great difficulty.	Astringent; styptic. Tannic acid. Gallic acid. (Fig. 20.)
LINACEÆ. LINUM USITATISSIMUM. *The Flax Plant.* The British Isles.	SEEDS—Smooth, bright, with edges sharp. *Colour*—EXT. brown. INT. white. OIL. *Colour*—Reddish yellow. *Odour*—Disagreeable. Dries quickly. HAIRS, surrounding seeds.	Demulcent; emollient.
MALVACEÆ. GOSSYPIUM HERBACEUM. *Cotton.*		
BYTTNERIACEÆ. THEOBROMA CACAO. South America. West Indies.	CONCRETE OIL—Expressed from the seeds, solid at ordinary temperatures. Melts at 122° Fahr. *Colour*—Yellowish white. *Odour*—As chocolate. *Taste*—Little; no rancidity.	(Fig. 63.)
AURANTIACEÆ. CITRUS BIGARADIA. *Seville Orange.* South of Europe.	RIND OF FRUIT—In thin sliced strips, dried. *Colour*—Bright yellow. *Odour*—Aromatic. *Taste*—Bitter. DISTILLED WATER. ESSENTIAL OIL.	As flavouring; slightly tonic. Essential oil.
CITRUS AURANTIUM. *Sweet Orange.*	DISTILLED WATER.	

Lemon. Europe.		
ÆGLE MARMELOS. *Indian Bael.* India.		
GUTTIFERÆ.		
GARCINIA MORELLA. *Camboge.* Siam. Ceylon.		
CANELLA ALBA. South America. West Indies.		
VITACEÆ.		
VITIS VINIFERA. *Vine.*		
ZYGOPHYLLACEÆ.		
GUAIACUM OFFICINALE. *Lignum vitæ.* West Indies.		

...juice; generally preserved with a small quantity of spirit.	Antiscorbutic; as flavouring.
RIND OF FRUIT—Thin slices, dried. *Colour*—Pale yellow. *Odour*—Sharp; aromatic. *Taste*—Acid.	Citric acid; essential oil.
FRUIT—Resembles, in shape and size, a pomegranate. EXT. hard, smooth rind. INT. many-celled. *Colour*—Yellow-brown. *Taste*—Astringent.	Astringent.
GUM-RESIN—(α) in block; (β) in pipes. (β) run, originally, in the bamboo-cane; generally hollow in centre. EXT. rather rough, and often coated with a greenish dust. *Colour*—Orange, with bright smooth fracture, forming light yellow emulsion with water. *Taste*—Bitter; nauseous.	*Small doses*, drastic purgative. *Large doses*, irritant poison. (Fig. 15.)
BARK—Flat or quilled pieces. *Colour*—EXT. light buff. INT. paler than exterior. *Odour*—Aromatic. *Taste*—Warm; pungent.	Aromatic tonic. Volatile oil. (Fig. 28.)
RIPE FRUIT, dried.	
RESIN—(α) tears; (β) lumps; (γ) round drops of various sizes. *Colour*—EXT., by reflected light, blackish green. INT., by transmitted light, brownish red. *Fracture*—Translucent; glass-like. *Odour*—Faint.	Active stimulant; alterative. (Fig. 31.)
POWDER—Brown, turning green.	
WOOD—Outer wood, sapwood, yellow, like box-wood. Inner wood, blackish.	
RASPINGS—Yellow and greenish black. *Odour*—Faint, when burned.	

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
RUTACEÆ.		
GALIPEA CUSPARIA. *Angustura.* South America.	BARK—Flat or quilled; in pieces about six inches long, thin and regular. *Colour*—EXT. yellowish grey; epidermis easily rubbed off. INT. brown; separable in splinters. *Fracture*—Short; resinous. *Odour*—Strong. *Taste*—Bitter; aromatic.	Tonic; stimulant; febrifuge. (Fig. 27.)
BAROSMA (DIOSMA). (α) BETULINA. (β) CRENULATA. (γ) SERRATIFOLIA. *Buchu.* South Africa.	LEAVES—(α) round or egg-shaped. (β) oblong; longer than α. (γ) lance-shaped; very long and narrow. Smooth, shining, coriaceous; minute oil-cells on both sides. *Colour*—Green, turning yellowish. *Odour*—Very powerful; to most persons disagreeable. *Taste*—Warm; mint-like.	In diseases of the bladder and urethra. (Fig. 65.)
SIMARUBACEÆ.		
(α) QUASSIA EXCELSA. (β) PICRÆNA EXCELSA. *Quassia.* Jamaica.	WOOD—(α) no longer imported. (β) with or without bark; generally used as raspings. *Colour*—Whitish yellow. *Taste*—Extremely bitter.	Stomachic tonic.
RHAMNACEÆ.		
RHAMNUS CATHARTICUS. Indigenous.	BERRIES—round, black, with mark of a cross on apex; four seeds. Sap-green when unripe, black-purple when ripe.	Violent cathartic, with thirst. Bitter principle; colouring matter.
ANACARDIACEÆ.		
PISTACHIA LENTISCUS. *Mastich.* Island of Scio, Levant.	RESIN—In tears, powdery from attrition; small in size. *Colour*—Light yellow. *Fracture*—Vitreous. *Odour*—Agreeable, increasing on application of heat. *Taste*—Slightly aromatic, softening on mastication (hence the latter word).	Used as a masticatory. (Fig. 37.)

AMYRIDACEÆ.		
BALSAMODENDRON MYRRHA. *Myrrh.* Arabia. Persian Gulf.	OLEO-GUM-RESIN—In tears, small; or in agglomerated nodules of various sizes. *Colour*—Reddish brown, with tendency to dark orange; oily veins of yellow and white in interior. *Fracture*—Dull and fatty; oily on pressure. In small tears the fracture is generally short. *Odour*—Little, but peculiar, and not unpleasant. *Taste*—Acrid; bitter; aromatic.	In small doses, stimulant. In large doses, irritant. Vol. oil; resin; gum. (Fig. 12.)
CANARIUM COMMUNE. *Elemi (probably).* Manilla.	OLEO-RESIN—Soft mass, hard and brittle on drying. *Colour*—Whitish yellow, with (often) green points. *Odour*—Aromatic, resembling that of fennel.	Local external stimulant.
LEGUMINOSÆ— **Sub-order, MIMOSÆ.** ACACIÆ SPECIES VARIÆ. *Acacia.* (α) Levant, Arabia. (β) Barbary. (γ) Senegal. (δ) East Indies.	GUM—(α) Turkey. Finest quality, in tears, clear, or opaque from numerous fractures. EXT. irregular, rough. INT. smooth; generally transparent. *Taste*—Viscid; insipid. (β) Barbary. Very inferior quality; dark and mixed with many impurities. (γ) Senegal. Used much in France; large pieces; hard. EXT. rough; "wrinkled." INT. conchoidal vitreous fracture. (δ) Common. Many impurities, and air-cells in the nodules.	Demulcent; emollient. Gum.
Sub-order, CÆSALPINEÆ. HÆMATOXYLON CAMPECHIANUM. *Logwood.* Honduras. Jamaica.	Dark red logs (or raspings).	Astringent.
TAMARINDUS INDICA. *Tamarind.* (α) East Indies. (β) West Indies.	(α) Shelled fruit from *short* pods, in hard mass, without sugar; dark brown. (β) Arranged in layers of *large* entire pods and sugar; stringy, with abundance of soft pulp. *Colour*—Reddish brown. *Taste*—Acid, but if sweetened, pleasant.	Gentle laxative.

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
CASSIA OFFICINALIS. *Senna.* 1. C. LANCEOLATA (α) (CASSIA ACUTIFOLIA) C. OBOVATA (β) *Alexandrian Senna.* Egypt and Shores of Mediterranean.	Alexandrian Senna. (α) Long leaf, mixed with (β) Shortish obovate leaf, with unequally oblique base. *Colour*—Silvery green. *Odour*—Resembling tea. *Taste*—Nauseous, bitter, slightly mucilaginous.	Mild drastic purgative. Bitter extractive glucoside. Essential oil. (Fig. 67.)
2. CASSIA ELONGATA. (C. LANCEOLATA ?) *East India Senna* (γ). *Tinnevelly Senna* (δ). Asia. India.	East Indian Senna. (γ) Longish leaf, but broken, discoloured, spotted. *Colour*—Brownish yellow. *Odour*—Musty. (δ) Tinnevelly, the *cultivated* plant. Often of fine quality; long large leaf. *Colour*—Bright green. N.B.—The *essential* character of Senna is, that the bases of the leaf are *unequal*, one larger than the other. (For adulteration with argel, see Part III. of this Section.)	(Fig. 66.)
CASSIA FISTULA. West Indies. East Indies.	Long (2 to 3 feet) lomentum or pod; about size of a finger. EXT. brown; smooth. INT. divisions, with seed and pulp in each cell.	Gentle laxative.
COPAIFERA MULTIJUGA *et species aliæ.* *Copaiba.* (α) Brazil.	OLEO-RESIN—Maranham. Clear, transparent, oily, viscid. *Colour*—Yellow to brown-red. *Odour*—Peculiar; somewhat aromatic. *Taste*—Acrid; nauseous. Para. Less viscid than above. In error, termed "Balsam."	Warm stimulant, especially to the mucous membranes. Volatile oil. Resin, dark, hard. ,, soft.
Sub-order, PAPILIONACEÆ. MYROSPERMUM (MYROXYLON) PEREIRÆ. *Balsam Peru.* South America: Peru (formerly), Guatemala, &c. (at present time).	TRUE BALSAM. (The name Balsam is *correctly* applied only to such natural productions as have in their composition cinnamic acid.) Thick, semi-fluid, consistence of treacle. *Colour*—Reddish brown to black. *Odour*—Fragrant, agreeable.	Heating; stimulant, mostly externally. Cinnamic acid; resin.

MYROSPERMUM (MYROXYLON) TOLUIFERUM. *Balsam Tolu.* Northern parts of South America.	TRUE BALSAM—Solid; soft when fresh, becoming hard and brittle. *Colour*—Yellowish brown. *Odour*—Fragrant; balsamic.	As Balsam Peru.
PTEROCARPUS SANTALINUS. Ceylon.	WOOD—Raspings. *Colour*—Dark red. *Odour*—Faint; peculiar.	For colouring.
SAROTHAMNUS SCOPARIUS. *Broom.* Indigenous.	TOPS OF PLANT—Green; peculiar odour when bruised.	Diuretic; aperient.
GLYCYRRHIZA GLABRA. *Liquorice.* Europe.	ROOT—Cylindrical; long. *Colour*—EXT. greyish brown. INT. yellowish. *Taste*—Sweet; mucilaginous; acrid.	Demulcent.
PTEROCARPUS MARSUPIUM. *Kino.* Malabar.	GUMMY EXUDATION—Small angular pieces. *Colour*—Black by reflected, ruby-red by transmitted light. *Fracture*—Shining; vitreous. *Taste*—Astringent.	Astringent; styptic. Tannic acid. (Fig. 36.)
ASTRAGALUS VERUS, &c. *Tragacanth.* Levant.	GUMMY EXUDATION—In flakes; thin, flat, smooth, broad. *Colour*—White or cream-coloured, semi-transparent. Swells on addition of water into gelatinous mass.	Demulcent. Soluble gum. Insoluble gum. (Fig. 53.)
ROSACEÆ.		
(*α*) ROSA CANINA. Indigenous.	(*α*) FRUIT (*hips*)—Red, shining, enclosing many seeds.	Slightly astringent.
(*β*) ,, GALLICA. Cultivated in Europe.	(*β*) PETALS—Purple-red, velvet; fragrant.	Feebly acid and bitterish astringent.
(*γ*) ,, CENTIFOLIA. South Europe.	(*γ*) FRESH DITTO—Producing otto roses and dist. water.	
BRAYERA ANTHELMINTICA. *Kousso, or Cusso.* Abyssinia.	FLOWERING TOPS OF HERB—The entire plant, with flowers, tied up in bunches or rolls. *Colour*—Reddish brown, with remains of pink flowers. *Odour and Taste*—Faint.	Anthelmintic. (Fig. 51.)

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
AMYGDALUS COMMUNIS. (α) *Var.* DULCIS. South Europe. (β) *Var.* AMARA. Mogadore, &c.	SEED. (α) Enveloped in three coverings, of which the "shell" is the inner one. "Jordan," long and thin, divisible into two portions. *Colour*—EXT. brown. INT. white. Some varieties are thicker and rougher. (β) Small and angular. *Odour*—Very powerful of prussic acid, if rubbed up with a little water.	(α) Fixed oil. (β) Fixed oil; emulsine; amygdalin. The two latter combine to form hydrocyanic acid.
PRUNUS DOMESTICA. *Prune.* South Europe.	Dried drupes of the plum.	Gentle laxative.
PRUNUS LAURO-CERASUS. *Cherry Laurel.*	LEAVES—Elliptical, short-stalked, coriaceous, shining, toothed, and with glands at base.	Diffusive stimulant.
MYRTACEÆ. MELALEUCA MINOR. *Cajuput.* Islands of E. Indies.	ESSENTIAL OIL—Limpid, transparent. *Colour*—Light bluish green. *Odour*—Strong; aromatic. *Taste*—Pungent; aromatic; then cool.	Antispasmodic.
CARYOPHYLLUS AROMATICUS. *Clove.* Islands of E. Indies.	IMMATURE FLOWER—Long tube (containing ovary) and quadripartite limb of corolla; ½ inch in length. Contains much essential oil. *Colour*—Reddish brown. *Odour*—Pungent; aromatic.	Aromatic stimulant. Essential oil.
EUGENIA PIMENTA. *Pimento.* West Indies.	UNRIPE BERRY—Round, rough, with remains of calyx; size of peppercorn. *Colour*—Dark brown. *Odour and Taste*—Aromatic; as a mixture of other spices.	
PUNICA GRANATUM. *Pomegranate.* South Europe.	ROOT-BARK—Rolled irregular quills. EXT. yellow-grey. INT. yellow. *Fracture*—Short. *Taste*—Astringent; feebly bitter.	Astringent. Tannic acid; gallic acid.

CUCURBITACEÆ.		
CITRULLUS COLOCYNTHIS. *Colocynth.* Countries bordering on Mediterranean.	FRUIT—Resembling apple, peeled; soft tough pulp; porous, with white-brown seeds. *Colour*—Yellowish-white. [The Mogadore variety is large, unpeeled, with smooth orange rind, and is not officinal.]	Drastic purge. Colocynthin.
ECBALIUM OFFICINARUM. *Squirting Cucumber.* Europe.	FRUIT—Nearly ripe. The sediment from its juice is *Extract Elaterii*. Small, irregular, curved light cakes; pulverulent, with short fracture. *Colour*—Yellowish green, becoming greyish by age. *Taste*—Bitter; nauseous.	Violent hydragogue purge. Elaterin (crystalline).
UMBELLIFERÆ.		
PIMPINELLA ANISUM (*Aniseed*). CARUM CARUI (*Caraway*). CORIANDRUM SATIVUM (*Coriander*). ANETHUM GRAVEOLENS (*Dill*). FŒNICULUM DULCE (*Fennel*).	FRUIT—Commonly called seeds; long, with peculiar odour; brownish yellow. Small, round, yellow. (CORIANDRUM.) Long, brownish. (ANETHUM.)	Aromatic. Volatile oil.
NARDOSTACHYS JATAMANSI. *Sumbul (probably).* (α) Russia. (β) India.	(α) ROOT, sliced. Long or round pieces, 1 to 2 inches thick; apparently a mass of agglomerated fibres. Thin cortex. *Colour.*—Dirty white. *Odour*—Pure musk-odour. (β) Inferior quality.	Antispasmodic; stimulant. Volatile oil.
CONIUM MACULATUM. *Spotted Hemlock.* Indigenous.	For description, see Part II. of this Section, "Medical Plants."	(Fig. 68.)
NARTHEX ASSAFŒTIDA. *Assafœtida.* Persia. North Hindostan. [The σίλφιον of the Greeks, the *laserpitium* and *laser* of the Romans, the *lasa, asa,* and *assa* of the Arabian school.]	FRUIT—Small, broadly ovate. OLEO-GUM-RESIN — In masses or tears; the latter is purest kind. At first soft, hardening by exposure. *Colour*—Dirty yellow-red, or bright pink to purply red. *Fracture*—Conchoidal, translucent, pearly white, becoming red by exposure to air, changing again to yellowish brown. *Odour*—Alliaceous; persistent. *Taste*—Acrid.	(Fig. 54.) Antispasmodic. Vol. oil; gum-resin.

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
GALBANUM OFFICINALE. *Galbanum.* India. Levant.	GUM-RESIN—In lump or tear, agglutinated or run together. *Colour*—Dark brownish yellow; mottled. *Odour*—Strong; slightly disagreeable. *Taste*—Acrid; bitter.	As assafœtida.
DOREMA AMMONIACUM. *Ammoniacum.* Persia.	In masses of separate tears, readily softening by heat. *Colour*—Pale yellowish brown. *Fracture*—Smooth, shining, opaque white. *Odour*—Peculiar, *sui generis*. *Taste*—Nauseous.	External stimulant. (Fig. 32.)
CAPRIFOLIACEÆ.		
SAMBUCUS NIGRA. *Elder.* Indigenous.	FLOWERS—In cymes of minute individual flowers. *Colour*—White. *Odour*—Pleasant.	Slight stimulant to weak constitutions.
RUBIACEÆ (CINCHONACEÆ).		
CEPHAËLIS IPECACUANHA. *Ipecacuanha.* Brazil.	ROOT—Irregular, rough, rounded, contorted, with annular depressions at frequent intervals. Some of the *smooth* stem adhering in many cases. *Size and Length*—Three to four inches in length, and size of small quill. *Colour*—EXT. brown-grey. The iron-grey is esteemed of superior quality to the lighter shades of brown. INT. whitish. In two portions. The cortical: active, brittle, pulverulent. The inner: inert, tough, woody, often resinous. *Odour*—Disagreeable; apparently musty. *Taste*—Nauseous; somewhat acrid.	Expectorant; emetic. Emetina; vol. fat; resin. (Fig. 19.)
CINCHONA CALISAYA. *Yellow Bark.* Bolivia. South America.	BARK—Flat or quills. Size, twelve or less, by one to three inches. EXT.—Furrows, *longitudinal*, from growth of plant or drying of bark.	Febrifuge. Quinia; kinic acid. (Fig. 6.)

	nne, not stringy or ligneous. *Taste*—Bitter, from quinine. Styptic, from acids. Slightly aromatic, from vol. oil. *Powder*—Cinnamon-brown.	
CINCHONA CONDAMINEA. *Pale Bark.* Loxa, in Ecuador, South America.	IN QUILLS. *Size*—Six to twelve inches long by one inch. EXT.—Rough, with grey lichens; wrinkled, with transverse, annular, sharp-edged furrows. *Colour*—EXT. grey-black, verging to reddish brown. INT. Cinnamon-brown. *Fracture*—Short transverse; splits longitudinally. *Taste*—Bitter; slightly aromatic; astringent. *Powder*—Light brown.	Tonic. Cinchonia. (Fig. 8.)
CINCHONA SUCCIRUBRA. *Red Bark.* Andes, S. America.	In large, flat, thick pieces, or smaller quills. EXT.—Very irregular, many warts, deep transverse fissures. *Fracture*—Fibrous or splintery. *Colour*—EXT. reddish brown. INT. dull red. *Taste*—Bitter; astringent. *Powder*.—Dull red-brown.	Tonic febrifuge. Quinia; cinchonia. (Fig. 7.)
VALERIANACEÆ. VALERIANA OFFICINALIS. *Valerian.* Europe.	RHIZOME, with long fibrils. *Colour*—EXT. brown. INT. whitish yellow. *Odour*—Powerful; fœtid.	Antispasmodic. Vol. oil; valerianic acid.
COMPOSITÆ. LACTUCA VIROSA. *Lettuce.* Indigenous.	FLOWERING HERB—Exuding a thick juice, which hardens on exposure. *Colour*—Bright green, when fresh.	Narcotic. Lactucarium.
ANTHEMIS NOBILIS. *Chamomile.* Indigenous.	HEADS OF FLORETS—On solid receptacle, with hairs between each floret. Two kinds. (α) Single yellow disc. (β) Double; all white florets of ray. *Colour*—White *ray*; yellow *disc.* *Odour*—Aromatic. *Taste*—Bitter.	Aromatic stomachic. Vol. oil; bitter extract.

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
ANACYCLUS PYRETHRUM. *Pellitory.* Levant.	ROOT—Fleshy when fresh, irregular when dry; cylindrical, furrowed; generally much worm-eaten; size of finger. *Colour*—EXT. dark brown. INT. yellow, with black specks. *Fracture*—Close; resinous. *Taste*—Pricking sensation, with heat.	Local irritant.
TARAXACUM DENS-LEONIS. (LEONTODON TARAXACUM.) *Dandelion.* Indigenous.	ROOT—Fleshy, large, tap-shaped, not tough, with yellow zones. *Colour*—EXT. tawny brown. INT. bright yellow. *Taste*—Sweet in winter, rather bitter in autumn, very bitter in spring and summer.	Stomachic tonic. Taraxin; sugar.
LOBELIACEÆ. LOBELIA INFLATA. *Lobelia.* United States.	FLOWERING HERB—Imported in oblong pressed packets, the whole green herb pressed together, generally having its seed-vessels. *Colour*—Greenish-yellowish. *Taste*—Acid; pungent.	Emetic; narcotic irritant.
ERICACEÆ. ARCTOSTAPHYLOS UVA-URSI. *Bearberry.* Europe. Indigenous.	LEAVES—Entire, shining, obovate, longish, with under surface reticulated. *Colour*—Dark green. *Taste*—Bitter astringent.	In bladder diseases. Tannic acid. (Fig. 64.)
STYRACEÆ. STYRAX BENZOIN. *Benjamin.* (α) Siam. (β) Sumatra.	BALSAMIC RESIN—In (α) tears or (β) amygdaloid masses. (α) Finest quality. Tears, sometimes adhering. *Colour*—EXT. reddish yellow. INT. whitish yellow. *Odour*—Very fragrant (as of vanilla), increasing with heat. (β) Usual quality of commerce. Large masses, white amygdaloid or mottled purplish brown, with white granite-like markings. *Odour*—Fragrant. *Taste*—Hot.	Local stimulant. Benzoic acid. (α Fig. 13.) (β Fig. 14.)

OLEACEÆ.		
OLEA EUROPÆA. *Olive.* South Europe.	OIL—Pale yellow; thin. *Odour*—Little, but peculiar. *Taste*—Bland. (Not a drying oil.)	Demulcent.
FRAXINUS ORNUS ET ROTUNDIFOLIA. *The Ash, giving Manna.* Sicily.	Exudation from incised tree. Soft, pearly flakes, about six inches long. Porous, friable, incurved. Inferior sorts in mass, of dirty colour. *Colour*—Cream-white. *Odour*—Faint. *Taste*—Sweet; mawkish.	Gentle laxative. Mannite.
ASCLEPIADACEÆ.		
HEMIDESMUS INDICUS. *Indian Sarsaparilla.* India.	ROOT—Knotted, long, tortuous, annulated, with transverse and longitudinal furrows. EXT. cork-like brown cortical portion. INT. woody. *Colour*—Brown. *Odour*—Pleasant; like sassafras. *Taste*—Feeble sweet-bitter.	Alterative. (Fig. 23.)
LOGANIACEÆ.		
STRYCHNOS NUX VOMICA. *Nux vomica.* India.	SEED—Convex on one side, concave on the other; round, flat. Diameter, one inch. EXT. thin coating, covered with soft hairs. INT. tough, horny. *Colour*—EXT. ash-grey. INT. partially translucent, in thin slips. *Taste*—Extremely bitter.	Acts on brain, spine, nerves. Strychnine; brucine. (Fig. 49.)
GENTIANACEÆ.		
GENTIANA LUTEA. *Gentian.* Europe.	ROOT—Branched, rugged, irregular. EXT. brown, with transverse furrows. INT. two yellow portions, separated by reddish line. *Taste*—Bitter.	Tonic.
OPHELIA CHIRATA. *Chiretta.* India.	PLANT—Long, smooth, branched. *Colour*—Pale brown. *Taste*—Very bitter.	

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
CONVOLVULACEÆ.		
EXOGONIUM PURGA. *Jalap.* Mexico.	TUBER, not true root. Bullet-shaped or oval; heavy, dense; larger tubers often sliced or divided. *Size*—From nut to orange. EXT. warty, shrivelled, covered with thin cuticle. INT. yellowish grey, with zones of resinous matter. *Colour*—Dark brown. *Odour*—Nauseous. *Taste*—Disagreeable.	Purge. Resin. (Fig. 4.)
CONVOLVULUS SCAMMONIA. *Scammony.* Levant.	GUM-RESIN, from incised root. Amorphous, irregular pieces, light, and often with air-cells. Contains 90 per cent. pure resin. *Fracture*—Resinous, shining, black; breaks in splinters; forms milk-like emulsion with the saliva. *Colour*—Ash-grey. *Odour*—Resembling that of old cheese. *Taste*—Peculiar; not agreeable. N.B.—The above is "Smyrna," or Virgin; "Aleppo" often contains 50 per cent. or more impurities. ROOT—Tap-shaped.	Purge. Resin. (Fig. 30.)
SCROPHULARIACEÆ.		
DIGITALIS PURPUREA. *Foxglove.* Indigenous.	LEAVES—See Part II. for description.	Depressant. Digitalia. (Fig. 71.)
SOLANACEÆ.		
HYOSCYAMUS NIGER. *Henbane.*	For description, see Part II.	Anodyne. Hyoscyamia. (Fig. 73.)
ATROPA BELLADONNA. *Deadly Nightshade.*	LEAVES—As above. ROOT—Branched, rough, brownish.	Narcotic poison. Atropia. (Fig. 72.)
DATURA STRAMONIUM. *Thorn-apple.*	LEAVES—As above. (Fig. 74.) SEED—Reniform; rough, flat. *Colour*—Brownish black. *Odour*—Peculiarly heavy when bruised. *Taste*—Feeble, nauseous, bitter.	Ditto. Daturia. (Fig. 55.)

CAPSICUM FASTIGIATUM. *Capsicum.* Zanzibar.	*Size*—Goose-quill. *Colour*—Yellowish green. *Taste*—Bitter, then sweet.	
NICOTIANA TABACUM. *Tobacco.* America.	FRUIT—Long, conical, shining pod. *Colour*—Orange-red. *Taste*—Pungent. LEAVES—Long, brown, dried, with hairs. *Odour*—Heavy.	
POLYGONACEÆ. RHEUM [PALMATUM, &c.] *Rhubarb.* Tartary and Thibet, (*viâ* China and India; none now *viâ* Russia.)	ROOT—Dried, decorticated. Large, irregular, heavy pieces (not spongy), round or flat (the root divided in centre), often with bored hole and remains of string; gritty when under the teeth. *Colour*—EXT. yellow, with darker marks. INT. bright, marbled with fine waving grey and red lines. *Odour and Taste*—Peculiar, and not unpleasant to many.	Purge, but not drastic. Gentle purgative and stomachic. Rhein (?); resin. (Fig. 1.)
MYRISTICACEÆ. MYRISTICA OFFICINALIS. *Nutmeg.* East Indies, Malayan Archipelago.	KERNEL OF SEED—Oval, furrowed, heavy, one inch in length. *Colour*—EXT. dark brown. INT. marbled with greyish brown and red. *Odour and Taste*—Aromatic and bitter.	
THYMELACEÆ. DAPHNE MEZEREUM ET LAUREOLA. *Mezereon.* Indigenous.	BARK—In quills, tough, pliable, fibrous. *Colour*—EXT. dark brown. INT. yellowish. *Odour*—Curious; unpleasant. *Taste*—Hot; persistently acrid.	Alterative. Acrid resin.
LAURACEÆ. CAMPHORA OFFICINARUM. *Camphor.* China, &c.	CONCRETE VOLATILE OIL—Solid, in crystalline tough white grains; in semi-transparent cakes. *Touch*—Soft; soapy. *Odour*—Powerful. *Taste*—Pungent, becoming cool.	Acrid antispasmodic.

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
SASSAFRAS OFFICINALE. *Sassafras.* North America.	ROOT—Sliced. Incurved pieces, with firm texture and well marked with zones. *Colour*—Brownish red. *Odour*—Penetrating.	Stimulant; sudorific.-
NECTANDRA RODIÆI. *Bebeeru greenheart.* British Guiana.	BARK—Large heavy pieces, 1 to 2 feet long. *Colour*—EXT. grey-brown. INT. dark brown. *Taste*—Bitter and astringent.	Tonic; febrifuge antiperiodic. Beberia.
CINNAMOMUM ZEYLANICUM. Ceylon.	BARK—In rolls of several interrolled quills, often 3 feet long; thin bark, splitting lengthways, dense in texture, smooth on surface. *Colour*—Tawny orange-brown. *Odour and Taste*—Aromatic and delicate. *Fracture*—Splintery.	Essential oil.
ARISTOLOCHIACEÆ.		
ARISTOLOCHIA SERPENTARIA. *Serpentary.* *Virginian Snake-root.* Virginia, North America.	RHIZOME—Tuft of thin long fibrils, hanging from roundish root-stalk, about three inches long. *Colour*—Yellowish, becoming dark brown. *Odour and Taste*—Between camphor and valerian.	Tonic febrifuge. (Fig. 21.)
EUPHORBIACEÆ.		
CROTON TIGLIUM. *Croton.* East Indies.	OIL—Expressed from seeds; rather viscid. *Colour*—Yellowish red. *Taste*—Acrid. *Odour*—Slightly nauseous.	Violent purge.
CROTON ELUTERIA. *Cascarilla.* West Indies. Nassau, N.P.	BARK—In quills, short, thin, or in broken pieces, 2 to 3 inches long. *Colour*—EXT. light brown-grey, with lichens; similar to "pale" bark (cinchona). INT. darker than exterior. *Fracture*—Close, resinous. *Odour*—Somewhat fragrant, increased when burned. *Taste*—Warm and bitter.	Fragrant; aromatic tonic. Tannin. (Fig. 9.)
ROTTLERA TINCTORIA. *Kamala.*	POWDER—Minute glands, from fruit; fine, mobile.	

	Colour—Reddish brown.	
RICINUS COMMUNIS. *Castor Oil.* East Indies. America. South Europe, &c.	OIL—Expressed from seeds; cold drawn; thick and viscid. The *best* is colourless, tasteless, and without smell; the *ordinary* has pale straw-colour, nauseous smell, and acrid taste.	Laxative purge.
PIPERACEÆ.		
PIPER NIGRUM. *Black Pepper.* Java, &c.	UNRIPE FRUIT (termed berries)—Small, round, rough exteriorly, shrivelled. On removing the "coat," white pepper produced. *Colour*—Black. *Odour and Taste*—Aromatic.	Spice. Resin; piperine.
CUBEBA OFFICINALIS. *Cubebs.* Java.	UNRIPE FRUIT—Small, round, with network of reticulations; on stalk more than its own length. *Colour*—Black. *Odour*—Characteristic. *Taste*—Camphoraceous.	In diseases of the urethra. Cubebine. (Fig. 52.)
ARTANTHE ELONGATA. *Matico.* Peru.	LEAF—Thickish, entire. *Colour*—Dull yellowish green. *Odour*—When fresh, aromatic.	As a mechanical styptic.
CANNABINACEÆ.		
CANNABIS SATIVA. *Indian Hemp.* India.	DRIED FLOWERING TOPS OF THE FEMALE PLANTS, *Cannabis sativa*, with flowers and fruit, if possible. *Colour*—Dull green. *Odour*—Peculiar.	Narcotic. Neurotic.
HUMULUS LUPULUS. *Hop.* Indigenous.	DRIED FRUIT (strobile) of female plant. Composed of scales, dry and coriaceous, with at base minute yellow grains of *lupuline*. *Colour*—Yellowish green. *Odour*—Pleasant; aromatic. *Taste*—bitter.	Stomachic tonic. Bitter extractive.
MORACEÆ.		
FICUS CARICA. *Fig.* Europe.	DRIED FRUIT—Brown; sweet; dries on exposure.	Demulcent laxative.
MORUS NIGRA. *Mulberry.* Europe.	FRUIT—An aggregation of small drupes. *Colour*—Dark purple-black. *Taste*—Acid; sweet.	Adjuvant.

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
ULMACEÆ.		
ULMUS CAMPESTRIS. *Elm.* Indigenous.	BARK—Broad thin pieces; tough and fibrous. *Colour*—Brownish yellow. *Taste*—Bitter and astringent.	Mucilaginous astringent.
CUPULIFERÆ.		
QUERCUS PEDUNCULATA. *Oak.* Indigenous.	BARK—Dried; fibrous and brittle. (Bark of small branches and young stems.) *Colour*—EXT. brownish grey. INT. cinnamon-brown. *Taste*—Astringent.	Astringent. Tannic acid.
QUERCUS INFECTORIA. *Galls.* (Diplolepis Galla tinctoriæ.) Europe.	GALLS—Excrescences caused by punctures and deposited ova; hard, heavy, round bodies; smooth, with short fracture. *Colour*—Bluish green or grey. *Taste*—Very astringent.	Tannic and gallic acid. (Fig. 50.)
LIQUIDAMBRACEÆ.		
LIQUIDAMBAR ORIENTALE. *Styrax.* Levant.	BALSAM—1st, In a rough state, as liquid storax; grey, opaque, viscid. (Also as S. calamita, a brown pulverulent mass.) 2nd, Prepared by straining. Pellucid, semi-fluid. *Colour*—Brownish yellow. *Odour*—Fragrant, resembling Bals. Peru.	Local stimulant. Cinnamic acid.
PINACEÆ (CONIFERÆ).		
JUNIPERUS SABINA. *Savin.*	For description, see Part II.	Irritant. Essential oil. (Fig. 70.)
ABIES EXCELSA. *Spruce Fir.*	Producing Burgundy Pitch.	
ABIES BALSAMEA. Canada.	Producing Canada Balsam; pale yellow, ductile, semi-fluid, oleo-resin, with peculiar odour.	
PINUS TÆDA ET PALUSTRIS.	Producing Frankincense, or "Thus."	

LILIACEÆ.

URGINEA SCILLA. *Squill.* Levant.	BULB—Sliced and dried; originally of large size, with fleshy inner scales; thick and juicy. *Colour*—Yellowish white. *Taste*—Acrid; bitter.	Expectorant; emetic. Acrid juice.	
ALOE SOCOTRINA. (α) *Socotrine Aloes.* Isle Socotra.	INSPISSATED JUICE OF LEAF—(α) Imported in casks and boxes, often mixed with "Hepatic." In irregular-sized pieces; dried. Translucent, if in flakes. *Fracture*—Shining; resinous. *Colour*—Brilliant garnet-red. *Odour*—Aromatic. *Taste*—Bitter, but slightly aromatic.	Purge. Aloine.	(α Fig. 34.)
(β) [*Hepatic Aloes.*]	(β) [As Socotrine, but opaque, not translucent. *Colour*—Dull liver; yellowish brown.]		(β Fig. 33.)
(γ) ,, BARBADENSIS. *Barbadoes Aloes.* Barbadoes and West Indies.	(γ) In gourds. Dull opaque mass. *Fracture*—Conchoidal, or showing numerous shell-like marks. *Colour*—Rich reddish brown or yellowish brown.		(γ Fig. 10.)
[(δ) ,, LUCIDA. *Cape Aloes* (not officinal). Cape of Good Hope.]	(δ) [Bright bottle-green mass, softish in hot weather. *Fracture*—Glass-like. *Odour and Taste*—Very nauseous. *Powder*—Yellow.]		(δ Fig. 11.)
MELANTHACEÆ. COLCHICUM AUTUMNALE. *Colchicum.* Indigenous.	CORM—If fresh, size of chesnut; fleshy, with two coats; generally dried in slices; flat, solid, and pulverulent. *Colour*—EXT. reddish brown. INT. opaque white. *Taste*—Bitter. SEEDS—Small, brown, hard; *not* oily, but acrid.	Narcotico-acrid. Colchicine.	
VERATRUM VIRIDE. *Green Hellebore.* North America.	RHIZOME AND ROOTS.—Cylindrical, with numerous fibrils.		

Natural Order, Name, and Geographical Source.	*Characteristics.*	*Properties and Active Principle.*
ASAGRÆA OFFICINALIS. *Sabadilla.* Mexico.	DRIED FRUIT—Light yellowish brown follicles. Seeds, black.	Used for preparation of veratria.
SMILACEÆ. SMILAX OFFICINALIS. *Sarsaparilla.* (α) Central America, *viâ* Jamaica. (β) Honduras, Vera Cruz, &c.	ROOTS (α)—In bundles many feet in length, with numerous rootlets ("bearded"). In two portions: (1) Cortex, starchy; (2) Centre, woody, with pith. *Colour*—EXT. reddish brown. INT. whitish. *Taste*—Mucilaginous. (β) Inferior in quality; more starch in cortex; fewer rootlets. *Colour*—Brown, not reddish brown.	Alterative. (Fig. 22.)
ZINGIBERACEÆ. ELETTARIA CARDAMOMUM. *Cardamom.* Malabar.	SEEDS, in pericarp. Fruit, coriaceous; short, ovate, ribbed, triangular. Seeds, angular, rough; light brown. *Colour*—EXT. brown. INT. white. *Odour and Taste*—Aromatic, almost camphoraceous.	Stomachic. Volatile oil. (Fig. 26.)
ZINGIBER OFFICINALE. *Ginger.* India, West Indies, &c.	RHIZOME, with root-bark removed. Irregular; thick, branching in lobes of various sizes. *Fracture*—Soft, not stringy. *Colour*—Creamy white. *Odour*—Aromatic. *Taste*—Hot, pungent. (Often bleached with lime.)	Aromatic sialagogue. Gingerine.
IRIDACEÆ. CROCUS SATIVUS. *Saffron.* Spain.	STYLE AND STIGMATA—Long threads, tripartite at apex. *Colour*—Brilliant orange, staining yellow. *Odour*—Strong; peculiar. *Taste*—Little.	Colouring properties.
GRAMINACEÆ. HORDEUM DISTICHON. *Barley.* Indigenous.	SEEDS, deprived of their husks. Oval, with mark of line down the side. *Colour*—Whitish.	Demulcent.

Wheat.			
SACCHARUM OFFICINARUM. *Sugar-cane.*	SUGAR; from juice.		
FILICES.			
ASPIDIUM FILIX-MAS. *Male Fern.*	RHIZOME—Tufted, scaly. *Colour*—Brownish, with reddish brown scales.		
ALGÆ.			
[CHONDUS CRISPUS. *Carrageen, or Irish Moss.* Ireland.]	[Not officinal. White to yellowish brown and grey. Crisp mass, swelling in water.]		Pectin, vegetable jelly. (Fig. 18.)
LICHENES.			
CETRARIA ISLANDICA. *Iceland Moss.* North Europe.	Flat, leafy mass; crisp, tough, coriaceous. *Colour*—Above, brownish grey; below, paler. *Taste*—Bitter and mucilaginous.	Tonic.	Starch; bitter principle. (Fig. 17.)
FUNGACEÆ.			
CLAVICEPS PURPUREA. *Ergot.* Europe.	Long, curved, solid, furrowed, acicular pieces. *Colour*—EXT. violet-brown. INT. pinkish. *Fracture*—Short. *Odour*—Not strong, but disagreeable.		

PART II.—**Medicinal Plants.**

The more important medicinal plants that are either indigenous or are cultivated in England, and therefore likely to be met with in a fresh state, are as follows:

1. Conium.
2. Aconitum.
3. Sabina.
4. Digitalis.
5. Belladonna.
6. Hyoscyamus.
7. Stramonium.

The whole of these plants have active principles so powerful, and properties so likely, when employed in excessive doses, to produce dangerous consequences, that it is absolutely necessary that their appearance should be familiar to every dispenser of medicine; not only ought there to be no chance of any substitution, by inadvertence, of one leaf for another, but there ought to be no difficulty in the recognition, among a handful of innoxious native plants, of the dangerously active Digitalis or the poisonous Conium.

Sect. III.—Materia Medica—*continued.*

The essential characters of these plants are—

Name.	*In a Fresh State.*	*In a Dry State.*
1. Conium maculatum. *Spotted Hemlock.*	Leaves and young Branches. *Leaves*—Much divided, smooth, feathery in appearance. *Stem*—Smooth, with dull purple stains. Rubbed with potash solution, a mouse-like fœtid odour is developed (conia, volatile alkaloid). (*Flower*—Small, white, arranged in umbels. *Fruit*—Small, ovate, two-celled, with wavy or crenate ridges.)	Leaves separated from branches; deep green. Same characters as the fresh. (Fig. 68.)
2. Aconitum napellus. *Aconite.*	Fresh Leaves and flowering Tops. *Leaves*—Palmate, divided, to the petiole (or leaf-stalk), into five deeply-cut, wedge-shaped lobes, each lobe having pointed segments. *Flowers*—A raceme of irregular deep-blue flowers. (*Fruit*—Dry; hard; follicular.)	Leaves much shrivelled. (Fig. 69.)
3. Juniperus Sabina. *Savin.*	Fresh Tops—Evergreen branches densely covered with minute thick leaves in four rows. *Odour*—Strong. *Taste*—Acrid; bitter. (*Fruit*—Round, purple, size of currant.)	(Fig. 70.)
4. Digitalis purpurea. *Foxglove.*	Leaves—Alternate, rugose. (*Flowers*—Crimson, hanging, bell-shaped, arranged on an elongated main stalk.)	Leaves, long, somewhat egg-shaped, tapering at base; short leaf-stalk, merging into the leaf itself; downy; paler on under surface. Dull green; slight odour; bitter taste. (Fig. 71.)
5. Atropa Belladonna. *Deadly Nightshade.*	Fresh Leaves with Branches. *Leaves*—Alternate, three to six inches, long; short leaf-stalks; egg-shaped, sharp-pointed, smooth, soft; margin undivided; often in pairs of unequal size (important character). (*Flower*—Solitary, bell-shaped, purple. *Fruit*—Violet-black berry, two-celled, size of	Leaves separated from branches. Leaves, dull-green; little odour or taste. (Fig. 72.)

	acute, unequally and acutely cut (sinuated), clammy and hairy; pale dull green colour; fœtid odour; slightly acrid taste. (*Flower*—Funnel-shaped, dull straw-colour, with purple veins. *Fruit*—Capsule opening transversely by convex lid; many-seeded).	fainter odour, and absence of clamminess. (Fig. 73.)
7. DATURA STRAMONIUM. *Thorn-apple.*	LEAVES—Unequal at base, large, smooth, acutely toothed, simply veined, light dull-green colour. (*Flower*—Large, white, regular, funnel-shaped. *Fruit*—Dry, prickly capsules, four-celled below, two-celled above, size of walnut.)	Leaves, large, ovate, deeply incised. (Fig. 74.)

PART III.—Adulterations.

The substitution of spurious or adulterated for genuine drugs is one of those abuses that, fortunately, with the increase of scientific knowledge, is very materially decreasing; still, great care must continue to be exercised. To still further decrease this evil, and to facilitate a greater familiarity with the appearance that the spurious drug affords, as contrasted with the genuine, the following tabular arrangement shows, side by side, the essential characters of the drug in a state of purity, with those that mark the inferior quality or the substitution of some other article.

The *principal* drugs are, however, here alone enumerated; a more complete table is given in the larger work of the author.

Article of Materia Medica.	*Adulteration or Substitution.*	*Characters.*	
		Genuine.	*Spurious.*
OPIUM. ("*Turkey.*")	(α) Ext. poppies. (β) Gum, starch. (γ) Chaff, dross. (δ) Stones, shot, lead. (ε) Inferior qualities, as "Egyptian."	Remains good. *Consistence*—Granular. *Colour*—Black, or reddish turning to black. *Odour*—Peculiar, but sweet.	Turns mouldy. (β) *Consistence*—Homogeneous; viscid. (α β) Pieces of dross, &c. (γ) *Colour*—Reddish brown; becomes lighter in colour. (ε) *Odour*—Sour, musty. (α) *Weight*—Unusually heavy. (δ)
CANELLA ALBA. *Bark.*	Winter's Bark.	*Colour*—EXT. light buff. INT. lighter.	*Colour*—EXT. brown. INT. darker than exterior.

Article of Materia Medica.	*Adulteration or Substitution.*	*Characters.* — *Genuine.*	*Characters.* — *Spurious.*
COCHLEARIA. *Horse-radish.*	Aconite. (*Root.*) (Fig. 25.)	Tapering very gradually, though suddenly for an inch at apex. *Length*—About eighteen inches to two feet. *Colour*—EXT. and INT. yellow-white. *Taste*—Simply pungent.	Tapering rapidly, almost conical; with fibrils. *Length*—About four inches. *Colour*—EXT. coffee-coloured. INT. bright yellow. *Taste*—Acrid, then producing a sensation of numbness.
ANGUSTURA BARK.	Strychnos nux vomica. (*Bark.*)	Thin regular pieces, about six inches long. *Ext.*—Yellowish grey epidermis, easily to be rubbed off. *Taste*—Aromatic.	Thick, irregular, often twisted, various lengths. *Ext.*—Rusty efflorescence (if old); warty. Leprous ,, (if young). *Taste*—Intensely bitter. Nitric acid stains bark green; inner bark, *red* ("*brucine*").
MYRRH.	Gum bdellium. (Fig. 12*.)	The size of the genuine and the spurious is about the same. Irregular-shaped tears or masses; soft or brittle. *Colour*—Mottled white and red. *Fracture*—Breaks with ease, and irregular. *Odour*—Aromatic.	Hard nodules. *Colour*—Uniform; dark red. *Fracture*—Very adhesive; tough; elastic; generally regular surface. *Odour*—Very slight.
GUM ACACIÆ.	Senegal gum.	Brittle pieces; small. *Colour*—Yellow-white. *Fracture*—Apparently crystalline (sometimes vitreous).	Hard, tough; large pieces; translucent. *Colour*—Often red or yellow. *Fracture*—Glassy; shining.
SENNA. (*Alexandrian.*)	Leaves of Cynanchum argel (also three other leaves, now, however, seldom met with).	Thin leaf. *Base of Leaf*—Unequal; one lobe larger than the other. *Veins*—Apparent, on under surface. *Colour*—Green.	Thick, coriaceous (leather-like). *Leaf*—Base, quite equal; two lobes equal in size. *Veins*—Buried. *Colour*—Very pale silvery green.

GUAIACUM. *Resin.*	Pine resin. (*From turpentine.*)	If burned, faint pleasant odour. *Colour*—Bright light yellow-red. *Heat*—Remains fluid at 280°. *Odour*—Peculiar to copaiba. If heated on bibulous paper, no stain. Dissolves ¼ weight mag. carb., remaining translucent, or solidifies with ⅛ weight mag. calc.	Disagreeable odour of turpentine. *Colour*—Dark brownish orange. (ζ) *Heat*—Becomes solid if heated to 276°. *Odour*—If heated, odour of turpentine. (η) Grease-spot remains. (θ) Opaque; thick with mag. carb.
COPAIBA. *Oleo-resin.* (Erroneously termed "Balsam.")	(ζ) Wood oil of India. (η) Turpentine. (θ) Castor-oil, or fatty oils.		
TRAGACANTH. *Gum.*	Foreign white gums, (Moussa and Taramania). (Considered by some to be an inferior quality of Tragacanth.)	In flakes; broad and thin. *Colour*—White.	In irregular pieces; small. *Colour*—Yellowish brown. (Sometimes whitened with carbonate of lead.)
OTTO OF ROSES. *Ess. Oil.*	(ι) Spermaceti. (κ) Oil geranium.	Crystalline. If quite at rest, forming slowly, and in transparent needles. *Sulphuric Acid*—Does not affect the perfume.	In a mass of semi-opaque crystals.(ι) *S. Acid*—Gives a disagreeable odour. (κ)
IPECACUANHA. *Root.*	(λ) Striated ipecac. (Psychotria). Undulated ipecac. (μ) (Richardsonia).	Annulated root, with deep transverse depressions, but none longitudinal. Outer cortical portion brittle, resinous, not amylaceous. *Colour*—Brown-grey.	Large-jointed, with longitudinal striæ. (λ) Little emetina. Undulated, with slight depressions; white, starchy; friable cortex. (μ) *Colour*—Black, darkening by moisture (λ); bright brown. (μ)
CINCHONA CALISAYA. *Yellow Bark.*	C. Carthagena. (Fig. 6*.)	In thinnish pieces. *Ext.*—Epidermis, or bark-coat, absent, or of a tawny yellow, darker than the bark. *Colour*—Tawny yellow. *Fracture*—Close. (The only sure way to judge cinchona barks is to test for the amount of alkaloids.)	Generally thick. *Ext.*—Velvety; greyish white; thin, or soft, warty. *Colour*—Lighter; bright yellow. *Fracture*—Splintery.
CINCHONA CONDAMINEA. *Pale Bark.*	"Grey" and rough barks. (Fig. 8*.)	In small thin quills. *Lichens*—In abundance. *Colour*—Silvery grey. *Fissures*—Transverse, with acute edges.	Flat pieces, or large coarse quills. *Lichens*—None (or rarely present). *Colour*—Reddish brown. *Fissures*—Often absent, or very irregular.
ANTHEMIS NOBILIS. *Chamomile.*	Matricaria chamomilla. *Common chamomile.*	Paleæ, or hairy scales, between each floret of the (yellow) disc. *Capitulum*, or head, solid pyramid.	No paleæ. *Head*—Hollow cone. (Only slightly convex in Matricaria Parthenium.)

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Article of Materia Medica.	*Adulteration or Substitution.*	*Characters.*	
		Genuine.	*Spurious.*
JALAP. Vera Cruz.	(ν) Jalap "Tampico." (Fig. 5.) (ξ) Jalap (stalk or woody). (ο) Rose jalap. (π) Bryony root.	Tubers, round or egg-shaped, corrugated; heavy; dense. *Fracture*—Darkish, resinous; close texture; very hard and rough.	Long, furrowed, cylindrical, but irregular. (ν) Very *smooth* coat, dark brown, uniform colour. (π) Flat, dry, large excised pieces. (ο) *Fracture*—Fairly resinous, but not dense. (ν) White, soft, woody. (ξ) Amylaceous, with rose perfume. (ο)
SCAMMONY. *Gum resin.*	(ρ) Chalk. (Fig. 29.) (s) Starch (τ) Gum, dextrine. (υ) Guaiacum resin. (φ) Jalap resin. (χ) Sand, earthy matters.	In irregular-sized lumps. Light, friable; pulverulent. Not affected by acid. Not affected by iodine. *Fracture*—Bright; translucent. *Colour*—EXT. greyish black. INT. green-black, with lustre. Forms emulsion with water. Unaffected by nitrous gas. Soluble in ether. Little or no *ash*.	In cakes, flat or round; regular (often). Heavy; hard; difficult to break up. (ρs) Effervesces with mineral acid. (ρ) Occasionally soft, moist, spongiform, or even mouldy. (τ) Decoction turned blue with iodine. (s) *Fracture*—Dull. *Colour*—Light grey or whitish, speckled. (ρs) Not liable to rub up with water. Cold alc. or ether decoction is turned blue by nitrous gas. (υ) Insoluble in ether. (φ) Remains after incineration. (χ)
RHEUM (PALMATUM?) *Rhubarb.* E. Indies, China.	Rhubarb, English. (Fig. 3.) ,, European. (Fig. 2.) (Often believed to be sold as "Siberian;" known on the Continent as "Rhapontic.")	Heavy; close; dense texture. Mottled; marbled with red and white *intersecting* veins. *Odour*—Strong. *Taste*—Gritty.	Light; often spongy. Often brighter in colour, but with the pink and white rays *radiating* in a very regular manner. *Odour*—Weak and faint. *Taste*—Weak; no grittiness.

CINNAMON. *Bark.*	Cassia. *Bark.*	Thin bark; cut at bottom of each quill. *Fracture*—Splintery. *Taste*—Delicate. *Length*—Often four feet long.	Thick; rough. *Fracture*—Close; almost resinous. *Taste*—Coarse. *Length*—Short; two to three feet at most; in bundles. Contains starch.
ALOES. (*Barbadoes.*)	(ψ) Aloes, Mocha. (ω) ,, cabalin, and other coarse qualities.	A pure description of aloes, generally in gourds. *Colour*—Clear liver. *Fracture*—Smooth; conchoidal. *Odour*—Not disagreeable.	Dark masses, in boxes or kegs; poor in quality. (ψ) *Colour*—Dark; rough. (ω) *Fracture*—Rough; unequal; irregular. *Odour*—Nauseous.
SARSA SMILAX. (*Jamaica.*)	Sarsaparilla, Honduras. ,, Lima. *Root.*	In bundles. Cortical portion, hard; slightly resinous.	Thin brittle epidermis. Cort. portion, mealy or starchy; large; takes up half the space of the root.
		Many rootlets (or beard). *Colour*—Brown-red. No chumps.	Few rootlets. *Colour*—Brown; not trimmed. Sometimes with chump.
CROCUS SATIVUS. *Saffron.*	(α) Safflower (florets).	Narrow shreds, one inch long; style and three stigmas.	Shape of flower, or florets, &c. (α)
	(β) Marigold.		Ditto. (β)
	(γ) Old saffron, oiled.	Does not stain paper with grease.	Pressed between damp bibulous paper, it leaves stain upon the paper. (γ)
	(δ) Shreds of meat, &c.	Instantly colours saliva or water.	Placed in water, falls to the bottom; does not colour the water. (δ) Heat develops curious smell. (δ)
	(ϵ) Sand or lead.	Totally destroyed by fire.	Remains after incineration. (ϵ)

These are the principal adulterations; there are others, but they can generally be detected by the student being *practically* acquainted (and not merely from works on Materia Medica) with the appearance the drug presents when in a state perfectly pure and genuine.

PART IV.—The Inorganic Chemicals of the Pharmacopœia.

In this part we only purpose giving the *main external* characteristics of the *more important* chemicals; the whole of them in detail, with their chemistry, method of preparation, tests, adulterations and their detection, incompatibles, action, and doses, are given in the work on the Major Examination by the same author. The characters will be found to be in some instances taken almost *verbatim* from the Pharmacopœia.

Of the elements which, alone or in combination, constitute all matter, the following, either themselves or in their compounds, are officinal:—

NON-METALLIC ELEMENTS.

1. Carbon.
2. Sulphur.
3. Iodine.
4. Chlorine.
5. Bromine.
6. Phosphorus.
7. Boron (as boracic acid).
8. Oxygen.
9. Hydrogen.
10. Nitrogen.

METALLIC ELEMENTS.

I. METALS OF THE ALKALIES.—1. Sodium. 2. Potassium. 3. Ammonium (hypothetical). 4. Lithium.

II. METAL OF THE ALKALINE EARTHS.—Calcium.

III. METALS OF THE EARTHS.—1. Aluminium. 2. Cerium.

IV. METALS PROPER.—(α) Zinc Class.—1. Zinc. 2. Magnesium (by some placed as a metal of the alkaline earths). 3. Cadmium.
(β) Iron Class.—1. Iron. 2. Manganese.
(γ) Arsenic Class.—1. Arsenic. 2. Antimony. 3. Bismuth.
(δ) Lead Class.—Lead.
(ε) Silver Class.—1. Copper. 2. Silver. 3. Mercury.

NON-METALLIC ELEMENTS.

Articles.	*Characteristics.*
1. Carbo	As C. animalis; and as C. ligni, from wood.
2. Iodum	In crystalline scales, with metallic lustre; violet fumes, if heated. *Colour*—Dark blue-black. *Odour*—Peculiar, resembling chlorine. *Taste*—Acrid. Gives blue colour with starch.
3. Sulphur. subl.	Fine but somewhat gritty powder; by microscope, small granules. *Colour*—Bright lemon-yellow.

,, præcip. . . . Generally (of commerce) containing sulphate of lime; whitish yellow, soft and satiny; but if pure, light grey-yellow, and less soft in appearance.
Odour—*None* of sulphuretted hydrogen.

Acid. sulphuric. . . Thick oily liquid, almost twice the weight of water.
Colour—White.
Odourless.
Acrid, most corrosive taste; violently corrosive in its action.

Acid. sulphuros . . . Colourless liquid.
Odour—Pungent and sulphurous.

4. Chlorine . . . . Gas. Yellowish green; pungent.

5. Bromine . . . . Thick oily liquid; volatile.
Colour—Deep red.
Odour—Peculiarly penetrating and disagreeable.

6. Phosphorus . . . Solid mass, generally run in wedges or sticks; translucent, soft, wax-like; emitting white vapour on exposure, and becoming luminous in the dark.
Colour—White, turning to pink on the exterior by exposure.
Odour—Peculiar, irritating.

7. Boron . . . . . As boracic acid in borax.

Borax . . . . Sodæ biboras. Crystals, generally of fair size; transparent, somewhat shining; soluble in water.
Colourless.
Taste—Sweetish; styptic.

Metallic Elements.

I. Metals of the Alkalies.

1. *Sodium.*

Sodii chloridum . . Common salt. In transparent cubic crystals, or white cryst. grains.

Soda tartarata . . In crystals, but generally met with in powder; crystals, transparent prisms.
Colourless.
Taste—Milder than, but resembling that of common salt.

Sodæ bicarbon. . . Crystalline scales, irregular; or more commonly as *powder*.
Colour—Opaque white.
Taste—Pleasant saline.

,, carbonas . . Crystals of a fair size, of a rhombic shape.
Colour—Transparent, colourless.
Taste—Strongly alkaline.

,, citro-tart. eff. . White granules; effervescing in water.

,, sulphas. . . In oblique prisms; crystals not very small.
Colour—Transparent white.
Taste—Bitter.

Articles.	*Characteristics.*
Sodæ valerian. . .	In masses; dry and amorphous; deliquescent. *Colour*—White. *Taste and Odour*—Of valerian.
2. *Potassium.*	
Potassii iodid. . .	An important and extensively-used compound of potassium. (Fig. 44.) *Crystals*—Cubic or quadrangular prisms. The angles of the cubes often remain distinct after the *sides* have entirely disappeared; hence they often appear *hollow*. *Colour*—Opaque white. *Taste*—Acrid; saline.
,, bromid. .	Smaller crystals than iodide, more opaque, and the sides not so often excavated; more "compact" crystals. (Fig. 45.)
Potassa caustica .	Or Potassa fusa (Liq. potassa evaporated to solidity). Generally in hard sticks, run into moulds when in a liquid condition. *Colour*—White. An acrid corrosive; very deliquescent.
,, sulphurata .	In tabular masses, generally broken up. *Fracture*—Yellowish brown. *Colour*—Greenish yellow. *Odour*—Very disagreeable; sulphurous. Yellow solution in water.
Potassæ acetas . .	Foliated mass, composed of shining scales, with a satin-like lustre. *Colour*—White. *Odour*—Slight. *Taste*—Saline. Its appearance is very characteristic.
,, bicarb. .	In powder or crystals; colourless, hard, opaque. (Fig. 35.)
,, bichrom. .	Crystals; transparent; four-sided. *Colour*—Bright red, shining. (Fig. 60.) Very stable in form and condition.
,, carbonas .	White crystalline powder. *Purified* pearl-ashes.
,, chloras .	Small scales, bright and glittering. (Fig. 40.) Colourless. *Taste*—Cool, saline.
,, nitras .	In masses of six-sided prisms, marked with fine parallel lines. (Fig. 62.) Colourless. Deflagrates on exposure to fire.
,, permanganas	Minute crystals, prismatic. Shining, and of slight metallic lustre. (Fig. 46.) *Colour*—Dark green and purple, forming a rich violet-red solution in water.

,,	pruss. flava .	Massive tabular quadrangular crystals, with more or less truncated edges. (Fig. 61.) *Colour*—Bright lemon-yellow; transparent. Odourless. *Taste*—Cool, saline.
,,	sulphas .	In hard small six-sided prisms, terminating in six-sided pyramids. Colourless.
,,	tartras acida .	Crystalline irregular masses, hard and gritty; or in an impalpable powder. (Fig. 57.) *Colour*—White. *Taste*—Agreeably acid.

3. *Ammonium.*

Ammon. benzoas .	Crystalline plates; soluble; colourless.
,, carbonas .	In semi-opaque crystalline masses. *Colour*—White where not translucent. *Odour*—Strong, ammoniacal. *Taste*—Pungent.
,, chloridum .	The Ammoniæ hydrochloras of B.P., 1864. In translucent, tough, fibrous masses. Devoid of colour or odour.

4. *Lithium.*

Lithiæ carbonas .	In small crystalline grains, or in powder (white). *Colour*—White, but it imparts a red colour to flame.
Lithiæ citras . .	White, amorphous, deliquescent powder; soluble in water.

II. Metal of the Alkaline Earths.

Calcium.

Calx	The alkaline earth (lime) of the metal *Calcium*. Yellowish white masses; hard, becoming friable when, by the addition of water, it has become hydrated, forming *Calcis hydras*.
Calx chlorata . .	Soft powder, slightly damp. *Colour*—Dull white. *Odour*—Strongly impregnated with chlorine.
Calcii chloridum . .	In agglutinated masses, light, dry, hard, and friable. Colourless; slightly translucent.

III. Metals of the Earths.

1. *Aluminium.*

Alumen . . .	In crystalline blocks, often of large size. Colourless; transparent. *Taste*—Strongly astringent (partly acid, partly sweet).
,, Exsic . .	Spongiform, friable, white mass. Ordinary alum with the water of crystallization driven off.

2. *Cerium.*

Cerii oxalas . .	A white *granular* powder; decomposed by heat into reddish brown oxide.

Articles.	*Characteristics.*
IV. METALS PROPER.	
(α) Zinc Class.	
1. *Zincum granulat.*	The fused metal poured from a height into water.
Zinci oxidum . .	Soft, velvety powder; on exposure to heat, assumes a pale yellow colour. *Colour*—Yellowish white, or nearly white. Odourless and tasteless.
„ acetas . .	Thin, silky, laminar crystals. *Colour*—Pearl-white. *Taste*—Sharp metallic.
„ chloridum . .	Fused and run into *pencils*, or tabular plates; very deliquescent. *Colour*—White; opaque. Strong caustic.
„ sulphas . .	Small, delicate, transparent prisms; much resembles Magnesiæ sulphas. (Fig. 58.) Colourless; somewhat shining. *Taste*—Metallic styptic.
„ valerianas . .	Minute crystals in a tabular arrangement. *Colour*—Pearly white. *Odour*—Slight of valerian.
2. *Magnesium.*	
Magnesia . . .	Oxide of magnesium. Powder; rather dense, usually termed "heavy calcined." *Colour*—White. Insoluble in water. By keeping, absorbs carbonic acid from the atmosphere.
„ levis . .	"Light calcined magnesia."
Magnesiæ carbonas .	Powder, minutely granular.
„ „ levis .	Powder, excessively light and flocculent; partly (under microscope) amorphous, partly very minute prisms. *Colour*—White. Odourless and tasteless.
„ sulphas .	Minute rhombic prisms, or rather long acicular crystals. (Fig. 59.) Colourless; often damp, sparkling. *Taste*—Saline-bitter, nauseous.
3. *Cadmium.*	
Cadmii iodid. . .	In foliaceous crystalline plates, with pearly lustre. *Colour*—White, with cream-coloured tinge.
(β) Iron Class.	
1. *Ferrum*	Iron wire or nails free from oxide (commonly termed "rust hair").

Ferrum tartaratum .	Scales, thin and transparent, dry, shining, brittle, breaking in irregular-sized pieces, with acute edges. *Colour*—Deep garnet-red. Odourless. *Taste*—Styptic. *Powder*—Dull brown-red.
,, redactum .	Metallic iron, with small variable percentage of oxide of iron (magnetic). Fine powder; attracted by magnet. *Colour*—Greyish black.
Ferri arsenias . .	Not often met with. Amorphous, smooth powder. *Colour*—Green. Tasteless.
,, carb. sacchar.	Small, amorphous, coherent, pulverulent nodules. *Colour*—Grey; as light as possible. *Taste*—Feebly of iron; sweetish.
,, et ammon. citras.	Scales, thin and transparent; shining, brittle; soluble in water. *Colour*—Deep ruby-red. *Taste*—Astringent.
,, et quin. cit. .	Scales, as above, but more brilliant and sparkling. *Colour*—Golden yellow, with a tinge of green. *Taste*—The bitter of the quinine and the chalybeate of the iron.
,, iodidum . .	In tabular masses or thin cakes, with metallic crystalline structure. Deliquescent. *Colour*—Chocolate-brown, with sometimes a greenish tint; forms a greenish solution, turning brownish red.
,, oxidum magneticum .	Powder; magnetic to a high degree. *Colour*—Brown-greyish black. Tasteless.
,, peroxydum hydratum	Powder; generally gritty; not magnetic; insoluble in water. *Colour*—Reddish brown. Odourless. *Taste*—Chalybeate.
,, phosphas .	Powder; amorphous and dense in its nature; insol. in water. *Colour*—Bluish grey, slate-colour; often varies in exact shade.
,, sulphas .	In crystals; modification of oblique rhombic prism; sometimes merely a mass of crystalline structure of a vague nature. Effloresces slightly (persulphate) in air. *Colour*—Green, with occasionally a bluish tint. Odourless. *Taste*—Strongly styptic.
,, ,, granulata	The preceding salt poured (in solution) into spirit; minute pale green crystals.
2. *Manganese.*	
Manganes. oxidum nigrum . . .	Heavy, dense powder. *Colour*—Black. Odourless and tasteless.

Articles.	*Characteristics.*
(γ) Arsenic Class.	
1. *Arsenicum.*	Arsenic in heavy white powder, or in *tabular*, stratified blocks, having a vitreous structure.
2. *Antimonium.*	
Antimonii oxidum .	One of those white powders which it is so difficult rightly to distinguish. However, there are several shades of white, and several degrees of density and weight. Thus arsenic and calomel are very much heavier than precipitated chalk; subnitrate of bismuth has a different shade from oxide of antimony. These differences will often afford a clue to the name and nature of the article. Heavy powder; unalterable in air. *Colour*—Greyish white. Tasteless.
Antimonium nigrum .	Sulphide of antimony; heavy, crystalline mass; or in dense powder. *Colour*—Black. Odourless and tasteless.
,, sulphuratum .	In powder; dense and heavy; soluble in caustic alkalies. *Colour*—Bright reddish orange. No odour or taste.
,, tartaratum .	In crystals, but almost universally met with in powder; heavy and white; soluble in water. Colourless; translucent; often partly opaque. *Taste*—Styptic; nauseous.
3. *Bismuthum.*	
Bismuthi subnitras .	Heavy powder (to microscope minute needle-like crystals), possessing great density. *Colour*—Brilliant white, tending to creamy white. *Touch*—Soft; velvety.
,, carb. . .	Very similar qualities.
(δ) Lead Class.	
Plumbum.	
Plumbi oxidum . .	Litharge; scales; having a quasi-crystalline structure; very dense. *Colour*—Pale brick-red.
,, carbonas .	Heavy, soft powder. *Colour*—White. Odourless and tasteless.
,, acetas . .	Generally in agglomerated masses of minute and brilliant acicular crystals; resembling sugar; slightly efflorescent. *Colour*—White; often sparkling in the light. Odourless.

Plumbi iodid. . .	Crystalline laminar masses; often reduced to powder. *Colour*—Magnificent yellow.	(Fig. 38.)

(ε) Silver Class.

1. *Cuprum* . . .	Copper, in the shape of wire. *Colour*—Red. *Odour*—Unpleasant, if rubbed. *Taste*—Disagreeable.	
Cupri sulph. . .	Oblique prisms, or their fragments; shining translucent crystals, frequently effloresing on exposure. *Colour*—Deep brilliant blue. *Taste*—Styptic; nauseous.	
2. *Argentum.*		
Argenti nitras . .	In tabular transparent crystals; or fused in sticks, at first white, but rapidly acquiring a blue-black colour. *Crystals*—Devoid of colour or smell. *Taste*—Metallic bitter. *Pencils*—Blackish in colour.	
3. *Hydrargyrum* . .	Mercury. Fluid at ordinary temperatures, and lustrous in its metallic reflection.	
Hydrargyrum ammoniatum	Heavy powder, or in masses easily reduced to powder; insoluble in water and in alcohol. *Colour*—Opaque white, of a creamy tinge. Odourless. *Taste*—Metallic.	
,, c. cretâ . .	Powder; light grey, not gritty (though rare to find it completely smooth). "Grey powder."	(Fig. 56.)
Hydrargyri iodidum rubrum	Semi-crystalline (with microscope) powder; heavy and dense. *Colour*—Brilliant scarlet; rendered yellow by heat cautiously applied.	
,, ,, viride .	Powder; dull yellowish green, darkening on exposure.	
,, oxidum rubrum	Powder; having the appearance of crystalline scales; very heavy. *Colour*—Orange-red. *Odour*—Very heavy.	(Fig. 41.)
,, perchloridum .	In semi-transparent masses of prismatic crystals; and powders with ease. Colourless and odourless. Acrid taste; violently poisonous.	
,, subchloridum .	Heavy powder; soft and velvety; becomes yellow if rubbed up for some time. Opaque white, of a creamy tinge. Odourless. Nearly tasteless. Insoluble in water, spirit, or ether.	

SECTION IV.

PHARMACY.

PART I.

THIS Section will be devoted to the Pharmacopœia. The *preparation*, however, of pharmaceutical products is not required to be taken up at this examination; and the perfect recognition of pharmaceutical preparations is essentially a subject that requires actual time spent in serious manipulation, and that cannot be acquired, in any satisfactory way, from books. The attempt would be time worse than thrown away, because spent in superficially gaining a smattering of *that* knowledge which ought to have been impressed on the student's mind by hours of patient work, and by days of practical experience.

The Section will be divided into two heads:—

I. Preparations of the Pharmacopœia. II. Groupings of Active Ingredients.

PART I.—Preparations of the Pharmacopœia.

1st. Preparations; as Extracts, Tinctures, &c.
2nd. Organic Chemicals; as Acid. benzoic., Spirit. ætheris nit., &c.
3rd. The Alkaloids.

1.—PREPARATIONS.

Class.	*Article.*	*Characteristics and Remarks.*
Aceta .	Acetum cantharidis .	Bright, dark, powerful vesicant; very pungent odour.
	,, scillæ . .	Very weak; preserved with a little proof spirit.
Acida .	Ac. sulph. arom. .	The aroma of two spices, removed and preserved with rect. spirit and acid. *Colour*—Light yellow-brown. *Odour*—Aromatic.
Adeps .	A. benzoatus . .	The lard has a slight odour of benzoin. By this treatment (with benzoin) it remains fresh for a length of time; it is immeasurably superior to the old practice of the addition of common salt.

Aquæ		These are generally a suspension of a small amount of the essential oil in water. They are either aromatic or fragrant, and from their nature (the oil being insoluble) weak, and generally used as menstrua for the exhibition of stronger medicines. They are colourless, limpid, and have the characteristics of ordinary water, with an aromatic odour. Aqua camphoræ is a simple maceration and partial solution in water; Aq. lauro-cerasi contains hydrocyanic acid, and is therefore very powerful in its action.
Cataplasmata		These poultices are always made up at the very moment they are required. The oil has a beneficial effect in Cataplasma lini in aiding the preservation of a moist heat.
Chartæ	C. epispastica	Pieces of paper with a thin coating of a whitish adhesive plaister on one side, showing the bright specks of cantharides.
Confectiones		These are preparations in which the active ingredients are diffused through some soft and moist medium, so as to produce a semi-fluid condition; they do not possess as much firmness as the "pilulæ," though more than the "unguenta" of the Pharmacopœia.
	C. opii	Dark brown; aromatic odour; the compound "pulvis" mixed with syrup.
	,, rosæ can.	Bright red; often used as a pill excipient where the quality of "adhesiveness" has to be given to the mass—*ex. gr.*, Pil. quiniæ. If freshly made, often too soft and fluid.
	,, sennæ	Dark blackish green mass; should be smooth and uniform. *Odour*—Pleasant. *Taste*—Sweet.
	,, sulphuris	Bright yellow, acquiring a very disagreeable odour by being kept.
Decocta		Their name indicates that the ingredients are wholly or partially exhausted by water in a state of ebullition; afterwards strained, and, if necessary, further diluted. They require to be made shortly before being actually required, as they will not keep for any length of time.
	D. aloes comp.	Dark, thick, reddish black liquid, with aromatic odour. On account of the presence of alcohol in the Tr. card. comp., this decoction, if made with care, will keep for years. The two gum-resins (aloes in ext. and myrrh) seem to be suspended, as an emulsion, by the carb. potash.
	,, Sarzæ comp.	Dark brown. *Odour*—Slightly aromatic (sassafras). *Taste*—Sweetish (liquorice) and peculiar, *sui generis* (sarsaparilla).
Emplastra		Intended to be spread on leather, linen, &c., for outward application. They are either— (α) Hard, requiring the action of heat to effect their fusion, *ex. gr.* Emp. picis co. (β) Soft, but requiring heat in their spreading, *ex. gr.* ,, belladonnæ. (γ) Soft, necessitating simple pressure, *ex. gr.* ,, cantharidis.

Class.	*Article.*	*Characteristics and Remarks.*
Emplastra—continued.		
		The principal plaister, the basis of so many of the Pharmacopœia formulæ, is E. plumbi. It is an insoluble "soap," the saponification of olive-oil and oxide of lead, with heat and in the presence of water. It is moderately hard, yellowish white, with a slight though peculiar odour. With resin and hard soap, it forms respectively two important plaisters—E. resinæ and E. saponis—entering into the composition of several other plaisters.
	E. ammon. c. hyd. .	So soft, as to be generally in a viscid, semi-fluid condition. *Colour*—Dirty yellowish brown. *Odour*—Disagreeable.
	,, cantharidis .	Softish mass, with much *plasticity*, combining both firmness and adhesiveness. *Colour*—Dark olive-green, with bright sparkling green points. *Odour*—Faint, but of its degree penetrating.
	,, cerat. saponis .	*Colour*—Yellowish brown.
	,, ferri . . .	*Colour*—Dull reddish brown.
	,, hydrargyri . .	*Colour*—Dark bluish grey; firm, though not brittle. *Odour*—Slight, but unpleasant.
	,, picis . . .	Hard and brittle. *Colour*—Bright brown-yellow. Little odour.
Enemata		Mixtures or emulsions. With the exception of E. tabaci (an infusion) and E. opii (a simple mixture), they are real emulsions; *i.e.*, an oil or resin suspended in water by means of an alkali, gum, mucilage of starch, &c.
Essentiæ		A solution of essential oil in rectified spirit.
Extracta		These preparations, the greater number of soft though solid consistence, are intended to contain, extracted by the most suitable menstrua, the active principles of the simple drug.
		We may consider them under the following heads:—
1*st. Solid.*		
	(α) Green .	The simple juice of the fresh plant expressed and evaporated, *ex. gr.* Ext. hyoscyam.
	(β) Aqueous	By means of water, rejecting what is insoluble:—1, Cold water, *ex. gr.* ,, aloes Soc. 2, Hot water, *ex. gr.* ,, gentian.
	(γ) Spirituous	By rectified spirit, *ex. gr.* ,, nux vomic.
	(δ) Spirituous and aqueous	1. Using the water to dilute the spirit, *ex. gr.* ,, rhei.
		2. Using the two menstrua separately, and then mixing the extracts, *ex. gr.* ,, jalap.
	(ε) Aqueous, containing spirit	An aqueous extract, adding spirit as a *conservative*, *ex. gr.* ,, papaveris.

	(ζ) Spirituous and ethereal	1. With spirit and ether,	*ex. gr.*	,, mezereon.
		2. Removing the oil with ether,	*ex. gr.*	,, stramonii. ,, ergotæ.
2nd. Liquid.		These extracts are not evaporated to the solid state.		
	(α) Aqueous.	1. Maceration in water, with spirit added to preserve it,	*ex. gr.*	,, sarsæ, belæ.
		2. Solution (as of extract) in water.	*ex. gr.*	,, opii.
	(β) Spirituous.			
	(γ) Ethereal.	With ether.	*ex. gr.*	,, filicis maris.

Ext. aloes Bbds. and ,, aloes Soc. . .	Dry mass, generally in small angular pieces. Very much the characters of the simple drug, but without the "resin"; not so aromatic or bright-looking. The former (A. Bbds.) has a nauseous, the latter (A. Soc.) a more aromatic odour.
,, belæ liq. . .	Dark brown, bright liquid; though with no strong odour. *Taste*—Astringent.
,, belladonnæ . ,, hyoscyam. . . ,, conii . .	Plastic mass of what is called good pill consistence. Each has its peculiar odour, only to be distinguished by practice. Henbane has the strongest smell, though belladonna has the more powerful *sui generis* odour. Conium develops a mouse-like odour on being rubbed up with Liq. potass. *Colour*—In mass, dark olive-green brown; in thin coats, green (owing to the presence of chlorophyll). Simple fresh vegetable juices, with chlorophyll, and afterwards albumen, removed, with, on subsequent addition of the former, evaporation at low temperature.
,, calumbæ . .	Thick, viscid, softish mass. *Colour*—Dark brown; light brown in thin layers. *Odour*—Not very characteristic. *Taste*—Very bitter. If badly made, burnt smell, and burnt half-sweetish taste.
,, cinch. flav. liq. .	Thickish liquid, though clear to reflected light. *Colour*—Dark brown in mass; yellowish red, tending to brown, in thin columns. *Odour*—Of cinchona, if carefully made. *Taste*—Very bitter.
,, colchici . ,, ,, acet. .	The evaporated "succus" or juice of the fresh corms deprived of its albumen. The acetic ext. simply differs in the acid having been added before the juice is pressed out. The latter has a strong smell of acetic acid; it is the only ext. that is acetous.
,, coloc. co. .	A tincture of colocynth, to which have been added Soc. aloes and scammony in their purest form (as ext. and resin respectively), with powdered cardamoms added at that point when their aroma will not be injured by further heat or prolonged evaporation. A hard, solid, brown-black mass, generally with smooth, shining surface. *Odour*—Strong (aloes brought out by soap) and aromatic (cardamoms). *Taste*—Nauseous and disagreeably bitter.

Class.	*Article.*	*Characteristics and Remarks.*
Extracta—continued.		
	Ext. ergot. liquid. .	A solution. Aqueous, with a small amount of spirit for conservation, of the active portion, deprived of albuminous matter by coagulation, of ergot of rye, from which the essential oil had been previously separated by washed ether. A dark liquid. *Colour*—Deep reddish brown. Little odour or taste.
	,, filicis liquid. .	An ethereal oil; or the oil (active principle), extracted with ether, from which the greater part of the latter has been recovered. Thick oily extract; semi-fluid; the oil with some ether remaining in it. *Colour*—Brownish green. *Odour*—Simply of ether.
	,, gentian. . .	An evaporated infuso-decoction, of pilular consistence. *Colour*—Dark brown. *Taste*—Very bitter.
	,, glycyrrh. . .	Double, lengthened maceration in cold; deprived, by usual heat, of albumen. *Colour*—Light yellowish brown. *Odour*—Insipid, resembling caramel. *Taste*—Sweetish.
	,, hæmatox. . .	A dry, smooth, hard, brittle mass, more lustrous than catechu, but not translucent as kino. *Colour*—Black.
	,, jalapæ . . .	Soft ductile mass. *Colour*—Dark brown. Strong peculiar odour and taste.
	,, humuli . .	Like Ext. jalapæ, a double extract, spirituous and aqueous, prepared separately (or rather the same hops *successively* exhausted), then mixed and evaporated. *Odour*—Faintly of lupulus.
	,, nux-vomic. .	An evaporated tincture, of which portions of the spirit had successively treated, to exhaustion, the seeds powdered by steaming and rapid desiccation. Soft in nature. *Colour*—Dark brown. *Odour*—Scarcely characteristic. *Taste*—Intensely bitter.
	,, opii . . .	A triple aqueous maceration. Soft, uniform mass (unlike the "tear-drops" in crude opium). *Colour*—Black. *Odour*—Very characteristic; a clear "opium" odour. *Taste*—Nauseous; bitter.
	,, ,, liquid. .	The foregoing, dissolved in water, with spirit for conservation. *Colour*—Brownish black. *Odour*—As "Ext.," but spirituous also. *Taste*—As above; very nearly resembling the tincture.
	,, papaveris. .	An infusion by percolation, with spirit for preservation, the albumen, &c., having deposited and been removed before final evaporation. Thick viscid mass. *Colour*—Rich red-black brown. *Odour*—Somewhat resembling preparations of senna. *Taste*—Insipid.
	,, Pareiræ ,, ,, liq.	Evaporated infusion by percolation. The first evaporated to pilular consistence; the second only to a certain point (still fluid), and spirit added, with filtration. Thickish liquid. *Colour*—Dark brownish black. *Odour*—Slight; "woody." *Taste*—Bitter; of the root.

,, physostigmatis .	An evaporated tincture (by maceration, percolation, and pressure), with spirit recovered. Soft mass. *Colour*—Deep brown. Very poisonous.
,, rhei . .	A weak (*much* water, *little* spirit) tincture, filtered from the matter deposited on standing and evaporated. Thick firm mass; becomes by time very hard and intractable. *Colour*—Dark reddish brown. *Odour and Taste*—Essentially of the root; if well prepared, not to be mistaken.
,, sarsæ liquid. .	The liquors, resulting from a double maceration, in hot water (160°), filtered, and then evaporated to a certain point only. Thick fluid, frothing much on being shaken. *Colour*—Dark brown-black; reddish brown in small quantities. *Odour and Taste*—Peculiar to sarsaparilla.
,, stramonii . .	An evaporated tincture, by percolation, with spirit recovered, of powdered seeds, previously deprived of their oil by washed ether. Firm, hard consistence. *Colour*—Black in mass. *Odour*—Strong; peculiar.
,, taraxaci . .	The juice of the fresh root, with the albumen removed by coagulation. Soft, yielding, with adhesiveness, but little firmness. *Colour*—Light brown, when good. *Odour*—Pleasant, resembling burnt sugar. *Taste*—Sweetish bitter.
Fel. bovinum	That portion of the fresh ox-bile which is soluble in spirit, evaporated to a pilular consistence. Soft mass. *Colour*—Yellowish green. *Odour*—To most, distasteful and nauseous. *Taste*—Partly sweet, partly bitter. [Gives the colaic test with sulphuric acid.]
Glycerina	Glycerine has the property of dissolving certain acids, salts, &c. The "Glycerina" are examples of this. With borax and carbolic acid, the solution is effected in the cold; tannic and gallic acids require slight heat; in the case of starch, a high degree of heat (240°) is required to break up the granules. The physical appearance of these preparations is this: a translucent almost transparent liquid; thick and jelly-like. *Colour*—White, or colourless. *Odour*—Scarcely any, with exception of the Ac. carbolic glycerine. *Taste*—Sweetish, with the special taste of the acid or salt in solution.
Infusa	Preparations which are to be made as required. If made as directed, they will not keep any length of time; it is, however, possible, by preparing and bottling in a special manner, to preserve them even without the addition of spirit; but it is not in our province to enter into these details of preparation. They are all made by pouring boiling water on the ingredient or ingredients, allowing the whole to stand for from fifteen minutes to four hours, and straining. With two exceptions:— (α) Inf. cusso is *not* strained, but taken, plant and water. (β) Inf. rosæ acidum is made with acidulated (sulphuric) water.

Class.	*Article.*	*Characteristics and Remarks.*
Jalapæ resina		The resin extracted by spirit (which is recovered), and afterwards dried. In small, opaque, bright, lustrous pieces, with angular edges; easily pulverized. *Powder*—Pale brown. *Fracture*—Resinous, shining, vitreous; translucent at edges. *Colour*—Dark brown. *Odour*—Not unpleasant; rather fragrant. *Taste*—Bitter, acrid. What is known as "Jalapine" is this article in a purer state, colourless, and finely divided.
Linimenta		For external use only. The majority come under one of the following types:— (*a*) Mixture (semi-solid), *ex.* Lin. pot. iod. c. sap. (*c*) Containing camphor and spirit . . *ex.* Lin. belladonnæ. ,, aconiti. (*b*) Liquid soap, *ex.* Lin. ammoniæ. ,, calcis. (*d*) Containing camphor and oil . . *ex.* ,, chloroformi· ,, hydrargyri.
	Lin. ammoniæ .	Thick, yellow, oily, liquid soap; odour of ammonia.
	,, aconiti . .	As Lin. belladon. Tincture by percolation, with camphor in solution.
	,, calcis . .	Same appearance as Lin. ammon.
	,, camphoræ .	Camphorated oil; one ounce to four fluid ounces. Presents the aspect of olive-oil, but with strong odour of camphor.
	,, ,, comp.	Tincture of camphor, perfumed with oil lavender, with ammonia so added as to give a clear solution. Colourless, with powerful odour.
	,, crotonis .	A solution, in spirit, of two oils, croton and cajuput.
	,, iodi . .	A solution, in spirit, of iodine, aided by the presence of iodide of potassium; containing also camphor. *Colour*—Reddish brown. *Odour*—Of iodine and camphor.
	,, potass. iodid. c. sapone	A fragrant aqueous solution of the "essential" components with glycerine; becomes firm on cooling. *Colour*—White; translucent. *Odour*—Of lemons.
	,, saponis .	A spirituous (diluted with $\frac{1}{5}$ water) solution, by maceration, of soap and camphor disguised with rosemary. *Colour*—Pale yellow. *Odour*—Camphoraceous, but somewhat fragrant.
Liquores		These are preparations, in the fluid state; for the most part aqueous. This class includes also those solutions, &c., that cannot well be placed in other categories. The majority are *colourless*, and prepared in the cold. We may classify *liquores* as follows:— (α) Simple solutions in water, *ex.* Liq. ammoniæ. ,, calcis. (β) Aqueous and spirituous, *ex.* ,, morph. acet. (γ) Acid or acidulated, *ex.* ,, arsenici hydrochloricus.

(ζ) Various menstrua, in the fluid state, or solutions of salts, } ex. „ arsenicalis. „ epispasticus. „ iodi.

Liq. ammoniæ . .	Aqueous solution of the gas. Colourless. Powerful ammoniacal odour. Pungent taste.
„ antim. chlor. .	Chloride of antimony, in a fluid (and fairly pure) state. Heavy but mobile liquid. *Colour*—Dark yellowish red. *Odour*—Disagreeable; generally of chlorine. If added to water, oxide of antimony is precipitated.
„ arsenicalis .	A fragrant solution of arsenite of potash. Thin liquid, much diluted. *Colour*—Light red. *Odour*—Of lavender.
„ bismuth. et ammon. citrat.	This solution is on the same principle as the ammonio-citrate of iron; in the presence of ammonia, the citrate of bismuth becomes soluble in water. Clear and colourless. Odourless. *Taste*—Saline, and slightly metallic.
„ calcis sacchar. .	A solution of lime in water, greatly aided by the presence of sugar in solution; contains nearly fourteen times as much lime dissolved as the ordinary liq. calcis. Colourless, clear, transparent. Odourless. *Taste*—Sweet.
„ chlori . .	Solution of chlorine gas in water. Possesses strong bleaching properties. *Colour*—Pale yellowish green. *Odour*—Strongly of chlorine; suffocating and irritating to the throat.
„ epispasticus .	The active principle of the cantharis, removed by means of acetic acid (by maceration), dissolved in ether (by percolation).
„ ferri perchlor. fortior.	A solution, in water, of perchloride of iron, oxidized by nitric acid from the chloride, produced by treating iron with dilute hydrochloric acid. A bright, clear liquid. *Colour*—Orange-brown; blackish in bulk. *Taste*—Very astringent.
„ ferri pernit. .	Same theory of formation as above. *Colour*—Bright reddish brown. *Taste*—Styptic; slightly acid.
„ „ persulph.	As above. *Colour*—Dense solution of a dark red. Inodorous. *Taste*—Strongly styptic.
„ iodi . .	Iodine dissolved in a solution of potass. iodid. Iodine is very soluble in the presence of this latter salt. *Colour*—Reddish brown. *Odour and Taste*—Slightly of iodine.
„ magn. carbon. .	Carb. of magnesia dissolved in water by the action of carbonic-acid gas. Colourless. Odourless. Almost tasteless.
„ morph. acet. .	A solution of the salt in dilute spirit.
„ plumbi subacet.	An aqueous solution of the salt, produced with the acetate and oxide of lead. A dense, clear liquid. Colourless. Odourless. Sweetish, and slightly alkaline taste. Produces a white coating on glass.

Class.	*Article.*	*Characteristics and Remarks.*
Liquores—continued.		
	Liq. potassæ ,, sodæ	A caustic solution of the alkalies. Colourless. Odourless. To the touch, caustic, almost *oily*.
	,, sodæ chloratæ	A solution of carb. soda, after the absorption of chlorine gas. A clear liquid. Colourless. *Odour*—Slightly of chlorine. *Taste*—Alkaline; astringent.
Lotiones	Lotio hydrarg. nig.	Colourless liquid, with black precipitate, suspended on shaking.
Misturæ		These are either (1) Emulsions, *ex.* Mistura ammoniaci; (2) A compound of several constituents, *ex.* ,, sennæ comp.
	Mist. ammoniac.	The oleo-gum-resin triturated in water. A milky fluid, with odour of the gum-resin.
	,, creosot.	Thin syrup, holding in suspension creosote, previously mixed with glacial acetic acid. *Odour and Taste*—Of creosote.
	,, ferri comp.	A protocarbonate of iron, preserved in an aromatic emulsion of myrrh. A white, milky liquid, with aromatic smell and taste, becoming brown by exposure to air.
	,, scammonii	A simple emulsion of the "resin" with milk.
	,, sennæ comp.	The ordinary "haustus niger." *Colour*—Black, but clear. *Odour*—Aromatic (cardamoms). *Taste*—Rather bitter, but aromatic and sweetened (liquorice).
Mucilagines		A solution or diffusion of gum or starch in water.
Olea		These are obtained either by— (1) Distillation, as *ol. caryoph.*, *ol. lavand.* (2) Expression, with or without the aid of heat, as *ol. amygd.*, *ol. ricini.* (3) Extraction, by treatment with simple heat of low temperature, as *ol. morrhuæ.* (4) Chemical formation, as *ol. sinapis ess.*, *ol. amygd. ess.*
1. Essential oils, by distillation.		The oils are *generally* light yellow, all with powerful odours peculiar to the substances from which they have been distilled, and with hot, often even acrid, taste.
	Ol. anisi	Pale yellow; at cool temperatures (50°), solidifies to mass of crystals.
	,, anthemidis	Pale blue, with odour of flowers.
	,, cajaputi	Bright green, mobile, transparent. Strong odour, and aromatic *cool* taste.
	,, carui	Colourless. Odour and taste of the "seeds" (fruits).
	,, caryophylli	Thick, *heavy* liquid; colourless, but becoming brown by exposure. Smell and taste of cloves.
	,, lavandulæ	Colourless or pale yellow, with odour of flowers, and hot, aromatic taste.

pleasant, fragrant odour.

,, sabinæ . .	Colourless or pale yellow. *Odour*—Peculiar, between the juniper and the fir.
,, terebinthinæ .	Colourless; limpid. *Odour*—Strong, disagreeable. *Taste*—Hot, acrid; nauseous.

2. Fixed oils, by expression.

Ol. amygdalæ. .	Thick, though limpid. Pale yellow. Almost odourless. Bland taste; not disagreeable.
,, crotonis . .	Very thick, but bright and clear. *Colour*—Brownish yellow; red by transmitted, greenish brown by reflected light (this is not always the case). *Odour and Taste*—Acrid; nauseous.
,, myristicæ express.	In solid blocks, generally long, oblong, and enveloped in "dry leaf." *Colour*—Bright orange. *Odour*—Like that of nutmegs.
,, olivæ . . .	Thin, clear liquid. Pale yellow. The slight odour and taste existing are peculiar to the olive, and are *not* unpleasant.
,, ricini . . .	Thick, viscid oil. Colourless. Odourless. Tasteless, or with slight acridity to the throat.
,, theobromæ .	Solid concrete fat, expressed in manufacture of chocolate. *Colour*—Yellowish white. *Odour*—Of chocolate. Tasteless, with no rancidity. *Fracture*—Clean; short.

3. Extraction, by simple heat.

Ol. morrhuæ . .	A thin, clear, bright oil, turning cloudy in cold weather. *Colour*—Very pale yellow. *Odour*—Very slight of fish. *Taste*—Bland. The odour and taste should be perfectly fresh, and almost agreeable.

Pilulæ . . . . . The pills form an important class among the preparations of the Pharmacopœia.

These pill-masses may be classed under the several divisions, already given in the Section of "Practical Dispensing," according to the excipients directed to be employed. They all ought to be in a good *plastic* condition, possessing firmness with soft, slightly moist adhesiveness. Many are rendered aromatic with an essential oil. The greater number, owing to their constituents, have a dark yellow- or red-brown colour.

Pil. aloes Barb. .	*Colour*—Dark brown. *Odour*—Aromatic. *Taste*—Warm bitter.
,, aloes c. myrrh .	*Colour*—Dark orange-brown. *Odour*—Slightly of saffron.
,, assafœtid. comp.	Prepared by heat. *Odour*—Fœtid, of assafœtida. *Taste*—Acrid.
,, coloc. co. . .	An intimate mixture of aloes and scammony (aided by the presence of sulphate of potash), with powdered colocynth. *Colour*—Dark brown. *Odour*—Aromatic (cloves.) *Taste*—Very bitter.
,, ferri iodid. .	Contains iodide of iron, added in its *nascent* state to powdered sugar and liquorice root for preservation. *Colour*—Dark brown-black. *Odour*—Of iodine.

Class.	*Article.*	*Characteristics and Remarks.*
Pilulæ—continued.		
	Pil. hydrargyri .	Soft, yet solid mass. *Colour*—Bluish grey.
	,, quiniæ . .	A simple mixture of quinia with confection of hips. *Colour*—Light red. *Taste*—Bitter.
	,, rhei comp. .	Powders, added to treacle and flavoured with oil of peppermint. *Colour*—Yellow-brown. *Odour*—Aromatic, of rhubarb. *Taste*—Warm bitter.
	,, saponis co. .	Opium in powder, made up with water and powdered soap.
Pulveres		These are mixtures of powders, all, with the exception of the three following, directed to be passed, after a thorough mixture, through a fine sieve.
		Pulv. amygd. comp. The almonds to be blanched and coarsely powdered.
		,, antimonialis ,, tragac. comp. } Simply to be mixed thoroughly.
		Their physical characters depend on those of their several ingredients; those of the principal one predominating.
	Pulv. antimon. .	Heavy, white powder; odourless and tasteless, or with a slight *earthy* taste.
	,, catechu comp.	Reddish brown. *Odour*—Of spices. *Taste*—Astringent.
	,, cretæ aromat. .	Bright orange-yellow. *Odour*—Aromatic. *Taste*—Sweetish.
	,, ipecac. comp.	Light brown. *Odour and Taste*—Of opium and ipecacuanha.
	,, jalapæ comp. .	Light brown. *Odour*—Of jalap. *Taste*—Sharp; nauseous.
	,, opii comp. .	Dark yellowish brown. *Odour*—Aromatic. *Taste*—Warm.
	,, rhei comp. .	The former "Gregory's Powder." Light pinkish yellow. Aromatic.
	,, tragac. comp. .	A mixture of gums, starch, and sugar. White; odourless. Sweet in taste.
Sapones		Ordinary "hard" and "soft" soap; the former the result of saponification between olive-oil and soda, the latter between olive-oil and potash. The former is hard, greyish white, dry, horny, inodorous; the latter is soft, gelatinous, yellowish green.
Spiritus		Some of these (three) will be found under "Organic Chemicals." The majority are solutions of essential oils (also camphor, chloroform) in rectified spirit. Spt. armoraciæ comp. (proof spirit and water) is a distilled product. They may be considered as strong tinctures of the essential oils; generally colourless, with the peculiar odour and taste of the essential oil, &c., held in solution. Spt. armoraciæ comp. has an aromatic odour and pungent taste. Spt. camphoræ and spt. chloroformi have a strong odour of their respective constituents.

Succi		These are the fresh juices of the plant, with one-fourth part rectified spirit added for conservation. They possess the peculiar taste and smell of the fresh plant.
	Succus taraxaci	Thin, clear, bright liquid. *Colour*—Light reddish brown. *Odour*—Of fresh dandelion-root. *Taste*—Peculiar; rather aromatic; agreeable.
Suppositoria		In hard, fatty masses, divided in conical forms. Contain oil of theobroma (Butyr cacaonis), wax, and lard, acting as menstrua for a powerful medicine. Hard, generally whitish, with little odour.
Syrupi		Syrup (or sugar dissolved in water) is a pleasant vehicle for the administration of many medicines. They are always thick, slightly viscid, with odour and taste of the principal ingredients, and necessarily sweet.
	Syr. aurantii	Yellowish. Has the pleasant taste and odour of orange-peel.
	,, ferri iodidi	A solution of iodide of iron in syrup. *Colour*—Light greenish yellow. Little odour. *Taste*—Sweet, with taste both of iron and of iodine.
	,, ferri phosphat.	Clear, translucent solution. Phosphate of iron, dissolved in dilute phosphoric acid, to which is added sugar. Colourless. Odourless. *Taste*—Slightly of iron.
	,, hemidesmi	An infusion, with sugar added. Peculiar flavour of the hemidesmus.
	,, papaveris	Sugar, added to a percolated and partially-evaporated infusion. Thick, viscid fluid. *Colour*—Dark brown. *Odour and Taste*—Slightly narcotic.
	,, rhamni	The "succus" evaporated, spiced, with a little spirit to it, and sugar added. Thick liquid. *Colour*—Dark purple-red. *Taste*—Acrid; slightly aromatic.
	,, rhei	A weak tincture, sweetened. *Colour*—Dark yellow-red. *Taste or Odour*—Of rhubarb and coriander.
	,, rhœados	An infusion, with sugar added, and spirit to preserve it. *Colour*—Bright red. No special odour or taste.
	,, scillæ	Acetous. *Colour*—Yellow-brown. *Odour and Taste*—Acetous.
	,, sennæ	A double digestion in water, evaporated, with spirit added. When filtered, sugar added. *Colour*—Yellowish brown. *Odour and Taste*—Of senna; slightly aromatic.
	,, tolutanus	Sugar, added to a decoction of the aqueous matter of tolu balsam. *Colour*—Pale straw-coloured. *Odour and Taste*—Of tolu.
Tincturæ		These are very important, and without doubt the more extensively used of the several preparations of the Pharmacopœia. They may be classed as follows, according to the menstruum employed:—

(*a*) Rectified spirit, as *tinct. benzoini comp.*, for articles of a resinous nature, &c.

Class.	*Article.*	*Characteristics and Remarks.*
Tincturæ—continued.		(*b*) Proof spirit, as *tinct. cardam. comp.*, for herbs, leaves, many roots, &c.
		(*c*) Ammonia, (1) Arom. spirit of ammonia, as *tinct. guaiaci ammon.* (2) Rect. spirit and solution of ammon., as *tinct. opii ammon.*
		(*d*) Ether. Ether and spirit, as *tinct. lobeliæ ætherea.*
		The general process, in the majority of cases, may be described as follows: Maceration for forty-eight hours (in several cases seven days), percolation, pressure, filtration, mixture of several liquors, and, if necessary, as in some cases, the further addition of spirit. Their physical characters do not show much variety. Generally thin, clear, bright, transparent liquids, yellow or reddish brown, with the peculiar odour and taste of the ingredients, though often partially masked by the spirit.
		We will now notice the special physical characteristics of some individual tinctures.
	Tinct. aconit. . .	As other tinctures of roots and leaves; bright, clear yellow, with little special odour.
	,, aloes . .	Dark-coloured. *Taste*—Bitter.
	,, assafœtid. .	Peculiar odour of the gum-resin; fœtid.
	,, aurantii .	Pleasant taste, and smell of orange-peel. Yellow in colour.
	,, benzoini comp.	Thick, semi-viscid fluid, with fragrant odour. Dark red-brown-black.
	,, calumbæ .	Light yellow; with very bitter taste.
	,, camph. comp.	Light yellow; disagreeable smell of camphor and oil of anise. Contains opium.
	,, capsici . .	Hot, pungent taste.
	,, cardam. comp.	Bright-red clear liquid. Aromatic in odour and taste. Coloured with cochineal.
	,, catechu . .	Darkish brown. Very astringent.
	,, cinchonæ comp.	Reddish yellow. Aromatic taste. Tonic, slightly bitter. "Pale" bark.
	,, cinchonæ flavæ	Yellow-brown. Bitter; febrifuge in taste. "Yellow" bark.
	,, conii . .	Light brown. Peculiar smell of conium (brought out by liq. potassæ). From the "fruit."
	,, croci . .	Bright yellow-orange. Used as a colouring.
	,, ergotæ . .	Dark brown. Faint nauseous smell and taste.
	,, ferri acetatis .	Bright solution. Orange-red. *Taste*—Slightly acetous; strongly of iron.
	,, ,, perchlor.	Dark blackish liquid. *Odour and Taste*—Strongly ferruginous.
	,, gentian. comp.	Yellow-brown. *Odour*—Aromatic. *Taste*—Bitter, but still pleasantly flavoured.

	,, guaiaci ammon.	Light yellow. Strong odour, and taste of ammonia (slightly aromatic).
	,, iodi . .	Dark reddish brown; bright red by transmitted light. *Odour and Taste*—Of iodine.
	,, lavand. comp.	Clear liquid of a dark *red* colour. Fragrant; and especially of lavender.
	,, lobeliæ æther.	Strong odour of ether.
	,, myrrh. . .	Yellow-brown. Odour and flavour of myrrh.
	,, opii . .	Dark brown-black; yellow-brown in very thin strata. Peculiar smell of opium. *Taste*—Acrid bitter.
	,, ,, ammon.	Deep yellow. *Odour*—Of anise and ammonia, with opium combined.
	,, quassiæ .	Very light yellow. Odourless. *Taste*—Very bitter.
	,, quiniæ . .	Light yellow. *Taste*—Aromatic, but bitter. A solution of quinia in tinct. aurantii.
	,, rhei . .	Dark yellow, almost black in masses. Peculiar smell and taste of rhubarb, with cardamoms combined.
	,, sennæ . .	Dark brown. *Odour*—Of senna, &c. *Taste*—Disagreeable.
	,, valerian. ammon.	Yellow. *Odour*—Of valerian and ammonia combined.
	,, zingiberis fortior.	Deep yellow. *Odour and Taste*—Very pungent, and strongly of ginger.
Trochisci		Lozenges form a method of administration applicable in those cases where a medicine of slight force is required to be administered in very small but repeated doses; at the same time with the advantage of being presented in a palatable form. The mass, before division and drying, is composed of gum acacia, sugar, and water; this serves as a vehicle to the more powerful ingredients.
Unguenta		These are masses, intended to be applied in a soft state to the body. Great smoothness is necessary, and also a gradual melting on the application of heat. Hence many, into the composition of which wax enters, are produced by heat; others require simply to be mixed thoroughly. In their physical characters, the principal one is *softness*, increased by heat; or *hardness*, melting with ease on the application of heat. Their colour and odour generally depend on the other ingredients; therefore those containing white, odourless powders are themselves without colour or smell. Special instances as follows:—
	Ung. simplex .	The base of many ointments. Wax, lard, and oil (almond) melted and allowed to cool. Hard; white, or tinged with yellow; odourless; easily melted.
	,, belladon. .	Light brownish olive-green. *Odour*—Of belladonna.
	,, canthar. .	Yellowish white. Strong blistering ointment.

Class.	*Article.*	*Characteristics and Remarks.*
Unguenta—continued.		
	Ung. cetacei	White, softish. Odourless, or very slight oleaginous smell.
	,, hydrargyri	Soft grey-blue mass, with peculiar (though slight) smell. Its colour distinguishes it.
	,, ,, oxidi rub.	Brilliant red. Little odour.
	,, ,, nitratis	Beautiful golden yellow, becoming discoloured by keeping. Unpleasant odour.
	,, plumbi iodid.	Bright orange ointment, with little or no smell.
	,, resinæ	Yellow-brown; hardish when cold. Slight odour of wax.
	,, sabinæ	Green. *Odour*—Of savin.
	,, sulphuris	Dull yellow. Disagreeable smell, increasing with age.
	,, zinci	Soft, creamy mass; white. Inodorous.
Vina		These preparations are weaker than tinctures, and therefore are often better suited for certain *articles* where a weak menstruum is desirable, or for certain *constitutions*, where strong alcohol is to be avoided. They are made— (1) By maceration and subsequent filtration, as *vin. ferri.* (2) By simple dissolution and filtration, as *vin. quiniæ.* Sherry is the wine directed for all except two; these are to be orange wine. They are thin fluids, with the essentials of their constituents. Where the latter does not contain any colouring matter, the wine is light yellow-orange in colour.
	Vin. aloes	Deep yellow. *Odour*—Aromatic. *Taste*—Bitter, but still aromatic.
	,, antimon.	Yellow. Of antimony; disagreeable.
	,, ferri	Yellow-brown. *Odour and Taste*—Strongly chalybeate.
	,, ,, citratis	Dark reddish yellow. Strong taste of iron. With orange wine.
	,, ipecac.	Light-coloured. Little smell. Nauseous taste.
	,, opii	Dark yellowish brown. *Odour and Taste*—Aromatic, but essentially of opium.
	,, quiniæ	Natural colour and odour of wine. *Taste*—Acid-bitter. With orange wine.
	,, rhei	Deep bright orange. *Odour and Taste*—Aromatic; warm; of rhubarb.

2. Organic Chemicals.—Principal Physical Characters.

Article.	*Characteristics.*
Acid. acetic. . . .	Liquid. Colourless. *Odour*—Pungent. *Taste*—Acid.
,, ,, glaciale . .	Transparent, colourless crystals; solid below 48° Fahrenheit. *Taste and Odour*—As above, but more powerful.
,, benzoic. . . .	Light, feathery crystals, in thin plates. *Colour*—White. *Odour*—Aromatic, as in gum benzoin. (Fig. 39.)
,, carbolic. . . .	Crystalline, or as an oily fluid. Colourless, with pungent odour.
,, citric. . . .	Crystals, generally small; very soluble in water (right rhombic prism). Colourless. Odourless. With agreeable acid taste. (Fig. 48.)
,, hydrocyanic. . .	Dilut., containing 2 per cent. "pure" acid. Colourless, very volatile liquid, with peculiar odour (noticed in peach-kernels). Highly poisonous.
,, gallic. . . .	Light, flocculent, crystalline needles. *Colour*—Whitish yellow. No odour. (Fig. 43.)
,, tannic. . . .	Spongiform masses. Much heavier than ac. gallic. *Colour*—Pale (or greenish) yellow. *Taste*—Very astringent. (Fig. 42.)
,, tartaricum . .	Crystals of various sizes; soluble in water (oblique rhombic prism). Colourless, with strong acid taste. The crystals are generally larger, rougher, and less transparent than those of citric acid. (Fig. 47.)
Æther	Volatile liquid. Colourless. Peculiar pleasant smell, and cool taste. Evaporates very rapidly. Produced by the action of sulphuric acid on spirit, and then purified.
Chloroformum . . .	Colourless, limpid liquid. *Odour*—Agreeable; ethereal. *Taste*—Sweetish. Very volatile. Produced by a complicated reaction, brought about by acting on spirit and water, with lime and chlorinated lime.
Collodion	Colourless liquid. *Odour*—As of ether. Dries rapidly, leaving a thin insoluble film. Pyroxylin (gun-cotton) dissolved in ether and spirit.
,, flexile . . .	The above mixed with Canada balsam and castor oil.
Creosotum . . .	Colourless (or tinged) liquid. *Odour*—Strongly empyreumatic. The only article resembling it in smell is carbolic acid, and this solidifies at a moderate temperature, while creosote remains fluid at an excessively low one. A product of the distillation of wood-tar.
Glycerinum . . .	A principle, sweet to the taste, met with in fixed oils, fats, &c. It generally contains a small amount of water. Thick, clear, transparent; viscid to the touch. Colourless. Without smell. *Taste*—Sweet.
Pyroxylin (*Gun-cotton*) .	Cotton treated by a mixture of nitric and sulphuric acids, washed and dried. Presents the appearance of ordinary cotton-wool. Violently explosive, leaving no ash.
Saccharum lactis . .	The sugar existing in milk, crystallized. In tabular or cylindrical masses of crystals. Heavy, dense, and hard; translucent. *Colour*—White, or dirty white. *Odour*—None. *Taste*—Slightly sweet; gritty.

Article.	*Characteristics.*
Spiritus ætheris nitrosi .	A solution of nitrous ether in spirit. Clear, transparent liquid; lighter than water; inflammable. Produces feeling of coolness to the touch (evaporation). Colourless. *Odour*—Peculiar; quite *sui generis*. *Taste*—Sharp, sweet; saline.
,, ammoniæ aromaticus	A fragrant spirituous solution of ammonia, produced by distillation. Bright, mobile fluid. No colour. *Odour*—Ammoniacal, but also fragrant. *Taste*—Principally of ammonia.
,, ammoniæ fœtidus .	Ammonia and rectified spirit, holding assafœtida in solution. Much resembling previous article in general characters. *Colour*—Tinged with yellow. *Odour and Taste*—Very nauseous and fœtid; at the same time ammoniacal.
,, rectificatus . .	Alcohol; containing some water. It is produced by the fermentation of saccharine matter, and subsequent distillation. Transparent, limpid fluid; lighter than water; very inflammable. Colourless. *Odour and Taste*—Termed *spirituous*.

3. ALKALOIDS.—PHYSICAL CHARACTERS.

Aconitia	Prepared by treating the aconite-root successively with spirit, ether, and dilute sulphuric acid. An amorphous powder; light in substance. *Colour*—White. No odour. A violent poison.
Atropia	Prepared from the root of Atropa belladonna, by a complicated process, the main features of which are a treatment with spirit, then with chloroform, and final crystallization from a second solution in spirit. In needle-like crystals; generally minute. White or colourless. No odour. An active poison.
Beberiæ sulphas . .	The alkaloid from the bark of Nectandra or Bebeeru bark. The main steps in the process of extraction are four solutions or treatments—1st, dilute sulphuric acid; 2nd, spirit; 3rd, again sulphuric acid; 4th, water, from which it is "*scaled*." In bright brown scales; thin and translucent. *Colour*—Brown; *dark* by reflected, *pale* by transmitted light. *Taste*—Bitter.
Digitalinum . . .	Prepared from leaves of digitalis by solutions—1st, in spirit; 2nd, in acetic acid and water; treatment with ammonia (and tannic acid), and subsequent purification. In small scales or spongiform masses. White, inodorous, and intensely bitter.
Morphiæ hydrochloras .	From aqueous solution of opium, removed as chloride, precipitated with ammonia, and redissolved in hydrochloric acid. In needle-like prismatic crystals; silky and flexible. *Colour*—Lustrous satiny white. No odour.
Morphiæ acetas . . .	Prepared from above. In white powder. Light and of a silky lustre. Similar properties to above.
Quiniæ sulphas . . .	Prepared from yellow cinchona bark, by, 1st, treatment with hydrochloric acid; 2nd, precipitation with soda; 3rd, solution in sulphuric acid, from which it is crystallized. In long thread-like crystals of a silky texture, often hanging together in masses. *Colour*—White. Inodorous. *Taste*—Very bitter.

Santoninum . . .	A neutral principle from santonica, removed by treatment with lime, precipitated by addition of hydrochloric acid, and finally crystallized from a solution in spirit. Flat rhombic prisms, in masses of crystals. Colourless, but rendered yellow by light. Odourless. *Taste*—Feebly bitter.
Strychnia	Prepared from nux-vomica seeds, by, 1st, removal with spirit; 2nd, treatment with water; 3rd, precipitation with ammonia; 4th, solution in spirit, with crystallization. In prismatic crystals, or small prismatic crystalline groups. Colourless. Odourless. *Taste*—Intensely bitter. A powerful poison.
Veratria	An alkaloid from cevadilla (seed), obtained by, 1st, removal as natural "gallate" with spirit; 2nd, precipitation with ammonia; 3rd, solution in hydrochloric acid; 4th, second precipitation by means of ammonia. A pale grey-white amorphous powder. *Colour*—Grey-white. *Odour*—None; but very irritant to nostrils. *Taste*—Bitter.

PART II.—**Proportions of Active Ingredients.**

Article.		*Preparations.*	*Proportions.*
Arsenic.	Arsenious acid	Liquor arsenicalis	4 gr. in 1 fl. oz.
		,, arsen. hydrochlor.	4 ,, in 1 ,,
	Arseniate of soda	Liquor	4 ,, in 1 ,,
Aconitia	Alkaloid	Unguentum	8 gr. to 1 oz.
Antimony	Oxide	Pulv. antimon.	1 part in 3.
	Sulphurated antimony	Pil. hyd. subchlor. co.	1 ,, in 5.
	Tartarated ,,	Unguentum	1 ,, in 5.
		Vinum antim.	2 gr. in 1 fl. oz.
Atropia	Alkaloid	Liquor	4 ,, in 1 ,,
		,, atrop. sulph.	4 ,, in 1 ,,
		Unguentum	8 ,, in 1 oz.
Ergota		Ext. liquidum	1 oz. in 1 fl. oz.
		Infusum	11 gr. to 1 ,,
		Tinctura	109 gr. to ,,

Article.		*Preparations.*	*Proportions.*
Hydrargyrum	Mercury	Hyd. c. cretâ	1 part in 3.
		Emplastrum	1 ,, ,, 3.
		,, am. c. hyd.	1 ,, ,, 5.
	Hyd. unguent.	Linimentum	1 ,, ,, 3.
	Hydrargyrum	Pilula	1 ,, ,, 3.
		Unguentum	1 ,, ,, 2.
		,, hyd. comp.	1 ,, ,, 4½.
	Hyd. iod. rubrum	Unguentum	16 gr. in 1 oz.
	,, oxyd. ,,	Unguentum	62 ,, ,, 1 ,,
	,, perchloridum	Liquor	½ ,, to 1 fl. oz.
		Lotio hyd. flav.	18 ,, to 10 ,,
	,, subchloridum	Lotio hyd. nig.	3 ,, to 1 ,,
		Pil. hyd. subchlor. comp.	1 part in 5.
		Unguentum	1 ,, ,, 6½, nearly.
	,, ammoniat.	Unguentum	1 ,, ,, 8.
Opium		Confectio	1 ,, ,, 40, nearly.
		Emplastrum	1 ,, ,, 10.
		Enema	½ fl. drm. tinct. to 2 fl. oz.
		Extractum	2 parts opium give about 1 part extract.
		,, liquid.	22 gr. ext. in 1 fl. oz., nearly.
		Linimentum	1 volume tincture in 2 volumes.
		Tinctura	33 gr. to 1 fl. oz., nearly.
		,, opii ammon.	5 ,, to 1 fl. oz.
		Trochisci	1/10 ,, ext. in each.
		Pulv. opii comp.	1 part in 10.
		Vinum	22 gr. ext. in 1 fl. oz., nearly.
		Pil. ipecac. c. scillâ	1 part in 16½, nearly.
		,, plumbi c. opio	1 ,, ,, 8.

	,, saponis comp.	1 ,, ,, 6, nearly.
	Pulvis cretæ arom. c. opio	1 ,, ,, 40.
	,, ipecac. comp.	1 ,, ,, 10.
	,, kino comp.	1 ,, ,, 20.
	Tinctura camphor. comp.	2 gr. to 1 fl. oz.
	Unguentum gallæ c. opio	32 gr. to 1 oz.
Morphia	Acetas vel hydrochlor.	10 parts opium give about 1 part morphia.
	Liq. morph. acetas ,, ,, hydrochlor.	4 gr. acetate or hydrochlor. in 1 fl. oz.
Plumbi acetas	Liquor plumb. subacet.	5 oz. in 1 pint.
,, iodidum	Emplastrum	1 part in 9.
	Unguentum	1 ,, ,, 8.
Potassii iodidum	Linimentum	22 gr. to 1 fl. oz., nearly.
	,, c. sapone	54½ ,, 1 ,, ,,
	Liquor iodi	30 ,, 1 ,,
	Tinctura iodi	5½ ,, 1 nearly
	Unguentum	1 part in 8¾ ,, ,,
	,, iodi	16 gr. in 1 oz. ,,
Quiniæ sulphas	Tinctura	8 gr. in 1 fl. oz.
	Pilula	3 parts in 4.
	Vinum	1 gr. in 1 fl. oz.
	Ferri et quiniæ citras	16 parts quinia in 100.
Strychnia	Liquor	4 gr. in 1 fl. oz.
Veratria	Unguentum	8 gr. to 1 oz.
Rad. aconiti	Linimentum	1 oz. to 1 fl. oz.
	Tinctura	54½ gr. to 1 fl. oz.
Camphor	Linimentum	1 in 5, nearly.
	,, camph. comp.	54½ gr. in 1 fl. oz.
	Spiritus	1 in 10.
	Tinct. camph. comp.	1½ gr. in 1 fl. oz.

Sect. IV.—**Pharmacy**—*continued.*

Article.	*Preparations.*	*Proportions.*
Cantharis	Acetum	2 oz. to 1 pint.
	Emplastrum	1 part in 3.
	Liquor epispasticus	1 oz. in 2½ fl. oz.
	Tinctura	5½ gr. in 1 ,,
	Unguentum	1 part to 7, nearly.
Ferri iodidi	Pilula	1 part in 3.
	Syrupus	4·3 grains in 1 fl. drachm.
Lobelia	Tinctura ,, æther.	54½ grains to 1 fl. oz.
Oleum crotonis.	Linimentum	1 volume in 8.

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"Observe degree, priority, and place,
Insisture, course, proportion,
. . . . . .
. . . in all line of order."—*Troilus and Cressida.*

THE END.

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